DOCUMENT RESUME

ED 258 040 CE 041 777

TITLE	Pastry Baking.
INSTITUTION	Marine Corps Inst., Washington, DC.
REPORT NO	MCI-33.8
PUB DATE	7 Nov 84
NOTE	92p.; Photographs will not reproduce well.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01/PC04 Plus Postage.
DESCRIPTORS	Adult Education; Behavioral Objectives; Continuing Education; *Cooking Instruction; *Cooks; *Correspondence Study; Course Descriptions; *Food; *Foods Instruction; Individualized Instruction; Learning Activities; Military Training; *Occupational Home Economics; Study Guides
IDENTIFIERS	*Bakers

ABSTRACT

Developed as part of the Marine Corps Institute (MCI) correspondence training program, this course on pastry baking is designed to provide a source of study materials on the preparation of pastry items within central pastry shops throughout the Marine Corps; it is adaptable for nonmilitary instruction. Introductory materials include specific information for MCI students, a course introduction, and a study guide (guidelines to complete the course). The 19-hour course contains seven study units. Each study unit begins with a general objective. The study units are divided into numbered work units, each presenting one or more specific objectives. Contents of a work unit include a text and study questions/exercises. Answer keys are found at the end of each study unit. At the end of the course is a review lesson. Topics covered in the study units include general baking rules, pastry baking ingredients, pies, cakes, cookies, quick breads, and yeast products. (YLB)

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33.8
7 Nov 1984

1. ORIGIN

MCI course 33.8, Pastry Baking, has been prepared by the Marine Corps Institute.

2. APPLICABILITY

This course is for instructional purposes only.

J. M. D. HOLLADAY
Lieutenant Colonel, U. S. Marine Corps
Deputy Director

INFORMATION

FOR

MCI STUDENTS

Welcome to the Marine Corps Institute training program. Your interest in self-improvement and increased professional competence is commendable.

Information is provided below to assist you in completing the course. Please read this guidance before proceeding with your studies.

1. MATERIALS

Check your course materials. You should have all the materials listed in the "Course Introduction." In addition you should have an envelope to mail your review lesson back to MCI for grading unless your review lesson answer sheet is of the self-mailing type. If your answer sheet is the pre-printed type, check to see that your name, rank, and social security number are correct. Check closely, your MCI records are kept on a computer and any discrepancy in the above information may cause your subsequent activity to go unrecorded. You may correct the information directly on the answer sheet. If you did not receive all your materials, notify your training NCO. If you are not attached to a Marine Corps unit, request them through the Hotline (autovon 288-4175 or commercial 202-433-4175).

2. LESSON SUBMISSION

The self-graded exercises contained in your course are not to be returned to MCI. Only the completed review lesson answer sheet should be mailed to MCI. The answer sheet is to be completed and mailed only after you have finished all of the study units in the course booklet. The review lesson has been designed to prepare you for the final examination.

It is important that you provide the required information at the bottom of your review lesson answer sheet if it does not have your name and address printed on it. In courses in which the work is submitted on blank paper or printed forms, identify each sheet in the following manner:

DOE, John J. Sgt 123-11-9999
08.4g, Forward Observation
Review Lesson
Military or office address
(RUC number, if available)

Submit your review lesson on the answer sheet and/or forms provided. Complete all blocks and follow the directions on the answer sheet for mailing. Otherwise, your answer sheet may be delayed or lost. If you have to interrupt your studies for any reason and find that you cannot complete your course in one year, you may request a single six month extension by contacting your training NCO, at least one month prior to your course completion deadline date. If you are not attached to a Marine Corps unit you may make this request by letter. Your commanding officer is notified monthly of your status through the monthly Unit Activity Report. In the event of difficulty, contact your training NCO or MCI immediately.

3. MAIL-TIME DELAY

Presented below are the mail-time delays that you may experience between the mailing of your review lesson and its return to you.

	TURNAROUND MAIL TIME	MCI PROCESSING TIME	TOTAL NUMBER DAYS
EAST COAST	16	5	21
WEST COAST	16	5	21
FPO NEW YORK	18	5	23
FPO SAN FRANCISCO	22	5	27

You may also experience a short delay in receiving your final examination due to administrative screening required at MCI.

4. GRADING SYSTEM

LESSONS			EXAMS	
GRADE	PERCENT	MEANING	GRADE	PERCENT
A	94-100	EXCELLENT	A	94-100
B	86-93	ABOVE AVERAGE	B	86-93
C	78-85	AVERAGE	C	78-85
D	70-77	BELOW AVERAGE	D	65-77
NL	BELOW 70	FAILING	F	BELOW 65

You will receive a percentage grade for your review lesson and for the final examination. A review lesson which receives a score below 70 is given a grade of NL (no lesson). It must be resubmitted and PASSED before you will receive an examination. The grade attained on the final exam is your course grade, unless you fail your first exam. Those who fail their first exam will be sent an alternate exam in which the highest grade possible is 65%. Failure of the alternate will result in failure of the course.

5. FINAL EXAMINATION

ACTIVE DUTY PERSONNEL: When you pass your REVIEW LESSON, your examination will be mailed automatically to your commanding officer. The administration of MCI final examinations must be supervised by a commissioned or warrant officer or a staff NCO.

OTHER PERSONNEL: Your examination may be administered and supervised by your supervisor.

6. COMPLETION CERTIFICATE

The completion certificate will be mailed to your commanding officer and your official records will be updated automatically. For non Mariner, your completion certificate is mailed to your supervisor.

7. RESERVE RETIREMENT CREDITS

Reserve retirement credits are awarded to inactive duty personnel only. Credits awarded for each course are listed in the "Course Introduction." Credits are only awarded upon successful completion of the course. Reserve retirement credits are not awarded for MCI study performed during drill periods if credits are also awarded for drill attendance.

8. DISENROLLMENT

Only your commanding officer can request your disenrollment from an MCI course. However, an automatic disenrollment occurs if the course is not completed (including the final exam) by the time you reach the CCD (course completion deadline) or the ACCD (adjusted course completion deadline) date. This action will adversely affect the unit's completion rate.

9. ASSISTANCE

Consult your training NCO if you have questions concerning course content. Should he/she be unable to assist you, MCI is ready to help you whenever you need it. Please use the Student Course Content Assistance Request Form (ISD-1) attached to the end of your course booklet or call one of the AUTOVON telephone numbers listed below for the appropriate course writer section.

PERSONNEL/ADMINISTRATION	288-3259
COMMUNICATIONS/ELECTRONICS/AVIATION	
NBC/INTELLIGENCE	288-3604
INFANTRY	288-3611
ENGINEER/MOTOR TRANSPORT	288-2275
SUPPLY/FOOD SERVICES/FISCAL	288-2285
TANKS/ARTILLERY/INFANTRY WEAPONS REPAIR	
LOGISTICS/EMBARKATION/MAINTENANCE MANAGEMENT/	
ASSAULT AMPHIBIAN VEHICLES	288-2290

For administrative problems use the UAR or call the MCI HOTLINE: 288-4175.

For commercial phone lines, use area code 202 and prefix 433 instead of 288.

PREFACE

PASTRY BAKING has been designed to provide privates through sergeants in occupational field 33 a source of study materials on the preparation of pastry items within central pastry shops throughout the Marine Corps.

SOURCE MATERIALS

FM 10-22 — Baking Operations, 3 June 1977

PASTRY BAKING

Course Introduction

PASTRY BAKING is designed to give food service personnel a working knowledge of the central pastry shop, instructions concerning proper sanitation, and methods used to prepare certain items in the central pastry shop.

ADMINISTRATIVE INFORMATION

ORDER OF STUDIES

Study Unit Number	Study Hours	Subject Matter
1	3	General Pastry Baking Rules
2	3	Pastry Baking Ingredients
3	2	Pies
4	2	Cakes
5	2	Cookies
6	2	Quick Breads
7	1	Yeast Products
	2	REVIEW LESSON
	2	FINAL EXAMINATION
	16	

RESERVE RETIREMENT CREDITS: 6

EXAMINATION: Supervised final examination without text or notes: time limit, 2 hours.

MATERIALS: MCI 33.8f, Pastry Baking
Review lesson and answer sheet

RETURN OF MATERIALS: Students who successfully complete this course are permitted to keep the course materials.

Students disenrolled for inactivity or at the request of their commanding officers will return all course materials.

HOW TO TAKE THIS COURSE

This course contains 7 study units. Each study unit begins with a general objective which is a statement of what you should learn from that study unit. The study units are divided into numbered work units, each presenting one or more specific objectives. Read the objective(s) and then the work unit text. At the end of the work unit text are study questions which you should be able to answer without referring to the text of the work unit. After answering the questions, check your answers against the correct ones listed at the end of the study unit. If you miss any of the questions, you should restudy the text of the work unit until you understand the correct response. When you have mastered one study unit, move on to the next. After you have completed all study units, complete the review lesson and take it to your training officer or NCO for mailing to MCI. MCI will mail the final examination to your training officer or NCO when you pass the review lesson.

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Equipment operation procedures	1-6	1-7
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MARINE CORPS INSTITUTE

STUDY GUIDE

Welcome to the Marine Corps Institute correspondence training program. By enrolling in this course, you have shown a desire to improve the skills you need for effective job performance, and MCI has provided materials to help you achieve your goal. Now all you need is to develop your own method for using these materials to best advantage.

The following guidelines present a four-part approach to completing your MCI course successfully:

1. Make a "reconnaissance" of your materials;
2. Plan your study time and choose a good study environment;
3. Study thoroughly and systematically;
4. Prepare for the final exam.

I. MAKE A "RECONNAISSANCE" OF YOUR MATERIALS

Begin with a look at the course introduction page. Read the COURSE INTRODUCTION to get the "big picture" of the course. Then read the MATERIALS section near the bottom of the page to find out which text(s) and study aids you should have received with the course. If any of the listed materials are missing, see Information for MCI Students to find out how to get them. If you have everything that is listed, you are ready to "reconnoiter" your MCI course.

Read through the table(s) of contents of your text(s). Note the various subjects covered in the course and the order in which they are taught. Leaf through the text(s) and look at the illustrations. Read a few work unit questions to get an idea of the types that are asked. If MCI provides other study aids, such as a slide rule or a plotting board, familiarize yourself with them. Now, get down to specifics!

II. PLAN YOUR STUDY TIME AND CHOOSE A GOOD STUDY ENVIRONMENT

From looking over the course materials, you should have some idea of how much study you will need to complete this course. But "some idea" is not enough. You need to work up a personal study plan: the following steps should give you some help.

(A) Get a calendar and mark those days of the week when you have time free for study. Two study periods per week, each lasting 1 to 3 hours, are suggested for completing the minimum two study units required each month by MCI. Of course, work and other schedules are not the same for everyone. The important thing is that you schedule a regular time for study on the same days of each week.

(B) Read the course introduction page again. The section marked ORDER OF STUDIES tells you the number of study units in the course and the approximate number of study hours you will need to complete each study unit. Plug these study hours into your schedule. For example, if you set aside two 2-hour study periods each week and the ORDER OF STUDIES estimates 2 study hours for your first study unit, you could easily schedule and complete the first study unit in one study period. On your calendar you would mark "Study Unit 1" on the

appropriate day. Suppose that the second study unit of your course requires 3 study hours. In that case, you would divide the study unit in half and work on each half during a separate study period. You would mark your calendar accordingly. Indicate on your calendar exactly when you plan to work on each study unit for the entire course. Do not forget to schedule one or two study periods to prepare for the final exam.

(C) Stick to your schedule.

Besides planning your study time, you should also choose a study environment that is right for you. Most people need a quiet place for study, like a library or a reading lounge; other people study better where there is background music; still others prefer to study out-of-doors. You must choose your study environment carefully so that it fits your individual needs.

III. STUDY THOROUGHLY AND SYSTEMATICALLY

Armed with a workable schedule and situated in a good study environment you are now ready to attack your course study unit by study unit. To begin, turn to the first page of study unit 1. On this page you will find the study unit objective, a statement of what you should be able to do after completing the study unit.

DO NOT begin by reading the work unit questions and flipping through the text for answers. If you do so, you will prepare to fail, not pass, the final exam. Instead, proceed as follows:

(A) Read the objective for the first work unit and then read the work unit text carefully. Make notes on the ideas you feel are important.

(B) Without referring to the text, answer the questions at the end of the work unit.

(C) Check your answers against the correct ones listed at the end of the study unit.

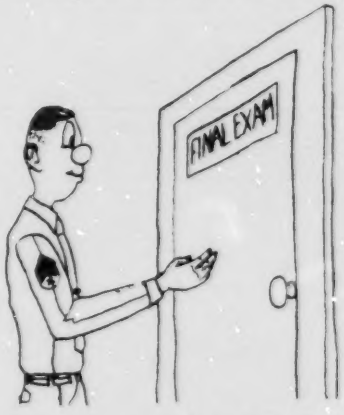
(D) If you miss any of the questions, restudy the work unit until you understand the correct response.

(E) Go on to the next work unit and repeat steps (A) through (D) until you have completed all the work units in the study unit.

Follow the same procedure for each study unit of the course. If you have problems with the text or work unit questions that you cannot solve on your own, ask your section OIC or NCOIC for help. If he cannot aid you, request assistance from MCI on the Student Course Content Assistance Request included with this course.

When you have finished all the study units, complete the course review lesson. Try to answer each question without the aid of reference materials. However, if you do not know an answer, look it up. When you have finished the lesson, take it to your training officer or NCO for mailing to MCI. MCI will grade it and send you a feedback sheet listing course references for any questions that you miss.

IV. PREPARE FOR THE FINAL EXAM



How do you prepare for the final exam? Follow these four steps:

(A) Review each study unit objective as a summary of what was taught in the course.

(B) Reread all portions of the text that you found particularly difficult.

(C) Review all the work unit questions, paying special attention to those you missed the first time around.

(D) Study the course review lesson, paying particular attention to the questions you missed.

If you follow these simple steps, you should do well on the final. GOOD LUCK!

STUDY UNIT 1

GENERAL PASTRY BAKING RULES

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT, YOU WILL BE ABLE TO IDENTIFY THE RULES FOR CLEANLINESS AND PERSONAL HEALTH IN A FOOD SERVICE OPERATION, THE STEPS FOR PROPER CARE OF BAKERY EQUIPMENT, THE PRINCIPLES OF INSECT, RODENT, MOLD, AND FOOD POISONING CONTROL, AND THE SAFETY RULES TO FOLLOW WHILE OPERATING EQUIPMENT IN A CENTRAL PASTRY SHOP.

If you are assigned to food service, you must be able to perform your job safely and efficiently. You must know how to employ rules of personal hygiene and how to operate and clean equipment, as well as use safety precautions while working with field or garrison dining facility equipment. You will also be responsible for keeping the facility operating under sanitary conditions to produce a product that is safe to eat.

Work Unit 1-1. PERSONAL CLEANLINESS AND HEALTH

LIST THE NINE BASIC RULES OF CLEANLINESS AND THE THREE RULES OF HEALTH.

All personnel in the dining facility or central pastry shop should observe the basic rules of cleanliness and health.

Cleanliness. The rules of cleanliness are as follows:

a. Keep your body clean. Facilities should be available for you to take hot and cold showers before changing into your uniform for work.

b. Wear clean food service uniforms, including headgear, while on duty. Always keep armpits covered. Turn in soiled clothing according to schedule. Launder personal clothing frequently.

c. Wash your hands with soap and water before beginning work and when returning to work from an absence, particularly; after using the toilet. Lather the hands well in hot water, rinse, and dry them on individual towels.

d. Keep your hair well groomed and clean and use effective hair restraints (caps, hair nets, etc.).

e. Brush your teeth at least once each day, preferably after each meal.

f. Keep your fingernails short and clean. Long nails tend to accumulate dirt and grease, and can contribute to the spread of bacteria.

g. Do not use common drinking cups, eating utensils, or toilet articles. Using someone else's personal items can increase the spread of germs.

h. Avoid coughing and sneezing when working around food and equipment. If you do cough or sneeze, cover your mouth and nose, and before returning to your work, wash your hands thoroughly.

i. Do not smoke or chew gum or tobacco in food preparation and serving areas.

Health. Food service personnel should observe the following health rules:

a. Medical examination. You should have a medical examination prior to assignment to duty. Records based on the findings of the examining physician should be filed by the dining facility manager or central pastry shop manager. When you are transferred you should take any medical records with you to your next command.

b. Illness. If a daily inspection reveals such ailments as acute colds, lingering coughs, skin or diarrheal infection, personnel should be referred to medical facilities.

c. Reexamination. When you have been absent with a communicable illness or have been ill for more than 30 days, you should have another medical examination before returning to duty.

EXERCISE: Answer the following questions and check your responses against those listed at the end of the study unit.

1. List nine rules of cleanliness.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

   g. _____

   h. _____

   i. _____

2. List the three rules of health to be observed by food service personnel.

   a. _____

   b. _____

   c. _____

Work Unit 1-2. CARE OF EQUIPMENT

IDENTIFY THE SIX STEPS FOR PROPER CARE OF BAKERY EQUIPMENT.

All tableware, kitchenware, and food contact surfaces of equipment must be cleaned properly and promptly after each day's use to prevent the growth of microorganisms (germs) and the accumulation of dirt and grease. Food items which contain milk, milk products, or eggs favor the growth of bacteria. You must make sure that equipment or utensils which come in contact with these foods are cleaned with great care. You may find it necessary to improvise cleaning utensils that will reach into cracks and crevices in some pieces of equipment. The following are the six steps for proper care of bakery equipment used in pastry baking.

a. Remove all dry ingredients with a soft bristle brush. Remove dry ingredients such as flour and baking powder with a soft-bristle brush. Avoid the use of steel-bristle brushes because the steel bristles will scratch the surface of the equipment and make it more difficult to clean.

b. Remove grease and other foreign matter with a sponge or towel. Use a cellulose sponge or disposable paper towel with an approved cleaner to remove grease, oil, and foreign matter from equipment. Material that has hardened on the equipment should be removed with a brush or disposable towel which has been dipped in an appropriate detergent solution.

c. Dry all equipment. After all equipment has been cleaned, wipe it dry to prevent rust, corrosion, or an accumulation of dust on damp surfaces.

d. Wash all detachable equipment parts. All detachable parts that come in direct contact with food must be detached, washed and rinsed thoroughly and air dried before being reassembled.

e. Clean all equipment after use. Clean ovens, cookers, and mixers inside and out after each day's use. Take care at all times to prevent spilling materials that will harden during the time the equipment is used. Clean all spills promptly.

f. Keep refrigerator neat and clean. Keep all refrigeration storage areas neat and clean at all times to prevent bacterial growth from developing. Keep these areas in good working condition. Defrost and clean them at regular intervals with soap or detergent and water.

EXERCISE: Anwser the following question and check your response against the one listed at the end of this study unit.

1. List the six steps for proper care of bakery equipment.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

Work Unit 1-3. INSECT AND RODENT CONTROL

LIST THREE ITEMS USED TO EXTERMINATE INSECTS AND RODENTS.

LIST FOUR STEPS WHICH LEAD TO INSECT AND RODENT CONTROL.

Flies and [illegible] can be found in any food service facility. These and other insects and rodents can be controlled by base pest control personnel. Insects and rodents are exterminated by disinfectants, insecticides, and fumigants. The extermination is usually accomplished on a regular schedule which is set up for each facilty. You can also be an important key to pest control by taking four steps.

a. Screen all windows and other outside openings and keep all screens in good repair.

b. To prevent the entrance of crawling insects and rodents, seal all openings in the walls, floors, and ceiling. All openings around pipes within or entering the building should be tightly sealed.

c. Cover all floor drains with metal grating. If grating openings are large enough to permit insects and rodents to enter, cover the bottom of the gratings with metal screening.

d. Carefully inspect all incoming supplies for infestation of insects and rodents. Inspect all items every day. If there is contamination, remove these supplies immediately to protect other materials.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List three items used to help exterminate insects and rodents.

   a. _____

   b. _____

   c. _____

2. List four steps which lead to insect and rodent control.

   a. _____

   b. _____

   c. _____

   d. _____

3. How often should incoming supplies be checked for insect infestation?

   a. Monthly
   b. Daily
   c. Weekly
   d. Biweekly

Work Unit 1-4. MOLDS AND FOOD POISONING

DESCRIBE MEASURES THAT SHOULD BE TAKEN TO CONTROL MOLD AND SALMONELLA FOOD POISONING.

All food service facilities are subject to strict controls to ensure that all food received is suitable for human consumption. Daily inspections of equipment, food storage areas, and food preparation areas are required to locate any place where mold and salmonella may breed. It is also important that you always be aware of the food conditions in your facility to locate and prevent mold and salmonella food poisoning.

Mold is a tiny vegetable plant which grows from spores in the air. These spores grow into easily recognized, dark, velvety spots on the outside of baked items. The conditions that speed up the development of mold are poor sanitation, warmth, moisture, and darkness. To avoid molds, use baked goods promptly. Some ingredients that can inhibit the growth of mold are sodium propionate, calcium propionate, and sodium diacetate. Using sanitary equipment and storing ingredients and baked items in a cool dry room with sunlight and ventilation are additional preventive measures that can be taken by you.

The term salmonella refers to a group of about 900 kinds of bacteria. The ones we are concerned with here frequently contaminate foods and cause illness from the food-borne bacteria. The severity of the illness depends on the kind of bacteria, the number of bacteria in the food, and the susceptibility of the consumer. In central pastry and dining facility kitchens the most common source of infection is eggs; however, salmonella has also been found in flour and dried coconut.

Infected ingredients are a serious hazard. Such ingredients may cause contamination of the food they are used in, if it is not adequately cooked, if containers (principally egg cans) are reused, or if contaminated dust or droplets infect other products during handling.

Working in a central pastry shop, you should take the following precautions for control of contamination:

Use only specification ingredients. Frozen eggs and meringue powder procured and inspected, as provided in current specifications, should be salmonella free.

Thaw eggs in cold running water or at refrigerator temperature. The practice of thawing frozen eggs at room temperature permits rapid growth of organisms which might contaminate the eggs.

Keep thawed eggs at 32° - 34°F until used (NAVMED P5010).

To minimize possible contamination from air-borne sources or from other factors, keep ingredient containers covered at all times when not in actual use.

Never use egg cans in any production operation or for the storage of ingredients or partially finished products. Egg cans are manufactured as single service containers and are not designed for reuse.

Mops and rags which have been used to mop up eggs or other materials that might be contaminated should not be used again until they have been sterilized and sanitized.

Do not handle the product more than necessary. Hand dipping and hand finishing greatly increase the chances for recontamination of the product.

Use only seamless equipment, which can be adequately cleaned and sterilized, in the preparation and handling of cream fillings and other perishable items.

Make certain the temperatures used in the production of cream fillings are adequate to destroy the germs. Cream filling should be heated to at least 185°F.

Pie shells should be filled with cream filling after the filling has been cooked and while it is still hot. Filling that has been cooked sufficiently will have a low bacteria count. If the filling is despensed hot, the chance for contamination of the filling during the production of the individual pies will be reduced.

Dispose of any leftover cream filling. Do not blend it with fresh filling the next day because the leftover filling could well have been contaminated during storage.

Promptly refrigerate any cream filled or custard-filled products. Should these products be contaminated with small numbers of harmful organisms, proper refrigeration will prevent their developing in sufficient numbers to cause illness.

Do not develop a false sense of security through using synthetic fillings which, by themselves, are incapable of supporting bacterial growth. The U.S. Public Health service has demonstrated that such fillings, when in contact with more nutritious materials such as pie shells, will permit microorganisms to grow and even increase in numbers.

EXERCISE: Answer the following questions and check your responses against the ones listed at the end of this study unit.

1. The four conditions that aid mold growth are:

   a. _____

   b. _____

   c. _____

   d. _____

2. Salmonella food poisoning is caused by a group of

   a. viruses.
   b. bacteria.
   c. molds.
   d. chemicals.

3. In the pastry preparation area what ingredient is most likely to cause salmonella food poisoning?

   a. Sugar
   b. Flour
   c. Coconut
   d. Eggs

4. Describe the preventive measures to control mold and salmonella food poisoning in the areas indicated.

   a. Ingredients _____

   b. Frozen eggs _____

   c. Thawed eggs _____

   d. Ingredient containers _____

   e. Egg cans _____

   f. Mops and rags _____

   g. Handling _____

   h. Equipment _____

   i. Cream fillings _____

   j. Pie shells _____

   k. Leftover cream filling _____

   l. Cream or custard filled products _____

   m. Synthetic pie filling _____

Work Unit 1-5. SAFETY IN THE CENTRAL PASTRY SHOP

IDENTIFY THE FOURTEEN SAFETY RULES TO FOLLOW WHILE WORKING IN THE CENTRAL PASTRY SHOP.

The person in charge of the food service facility is responsible for setting up a clearly defined safety program and for seeing that all personnel understand and follow it. The most hazardous job in the central pastry shop is the operation of equipment. Therefore, before attempting to use the equipment, make sure you are trained to operate it. This means that even if you used that type of equipment in another facility, you must be checked out on its operation in the facility to which you are now assigned. Check each item of equipment for mechanical hazards and make sure it has the proper safeguards. It is important to remember safe practices regarding specific hazards of the job, the use and importance of safeguards, the necessity for reporting every injury, and above all, the importance of operating as a team in carrying out the safety program. The following are fourteen general rules of safety that should be followed:

a. Do not carry items in your shirt pocket. There is a tendency for these items to fall into the product being made or to jam the machinery and cause a breakdown.

b. Keep your mind on your work. The more you allow your mind to wander, the more it is possible for accidents to occur.

c. Do not wear rings or jewelry. There is always a tendency to catch a ring, watch, or other jewelry on machinery, making a serious accident possible.

d. Watch where you are walking. Be aware of where you are walking and of possible items on the floor such as water and grease that could cause you to slip.

e. Eliminate slippery spots on the floor. If something is spilled, it should be cleaned immediately to ensure the safety of all concerned.

f. Learn to lift properly. When lifting heavy items, lift straight up using your legs, not your back. Be sure to grasp the item firmly.

g. Report any unsafe conditions. If you see something unsafe, don't wait for someone else to spot it; report it yourself immediately.

h. Read and heed all safety signs. These signs are posted for your benefit. They could help prevent an accident to you or by you.

i. Stay clear of moving equipment. Be especially careful and pay attention to safe handling procedures.

j. Use the right utensils, equipment, or tools for the job. If the right tools are not used, there is a greater chance for an accident to occur. Certain utensils and tools are designed for specific jobs only.

k. Keep all safeguards in place. Safeguards are designed to protect you. Leave them where they belong.

l. Keep your work area clean. This not only improves safety but also sanitation.

m. Get first aid promptly if needed. If an accident requires first aid, administer it promptly. Unless it is a minor accident, send the individual to the dispensary. Usually all facilities have first aid kits for cuts and burns. Even so, the accident victim should see medical authorities.

n. Use food handler pads for hot items. These are designed of this purpose. If they are unserviceable, new ones should be issued, but never handle hot items without protection.

EXERCISE: Answer the following question and check your response against the one listed at the end of this study unit.

1. Briefly list the fourteen safety rules to be followed when operating equipment.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

j. _____

k. _____

l. _____

m. _____

n. _____

Work Unit 1-6. EQUIPMENT OPERATION PROCEDURES

DESCRIBE SPECIFIC SAFETY RULES FOR THE MIXING MACHINE, OVENS, DOUGHNUT MACHINE, AND STEAM KETTLES USED IN PASTRY PREPARATION AREAS.

When handling any equipment, you must learn to keep all guard and safety devices in good working condition and observe the following specific safety rules given for the equipment listed.

a. Mixing machines.

(1) Become throughly familiar with controls and operating and safety instructions before attempting to operate a mixer.

(2) Check mixer bowl before it is used to ensure that no utensils or objects are inside it.

(3) Always secure beaters or other accessories to the vertical shaft of the mixer before starting the mixer.

(4) Be sure your hands are dry before operating the starter switch.

(5) Do not rest your fingers on the edge of the bowl while the machine is in operation.

(6) Remember that the mixer accessory makes a number of revolutions after the power is shut off.

b. Ovens

(1) Provide adequate protection against burns by using authorized bakery pads.

(2) Establish correct procedures for handling and dumping hot pans.

(3) To avoid eye injury from steam and heat, establish correct procedures for positioning your head while reaching into hot ovens.

(4) When loading rotating ovens, use every other shelf and put the pans in an oblong position so as not to tip the shelves or catch the pan on another shelf while the oven shelves rotate.

c. Doughnut machine.

(1) Never try to free the dough from the cutter while the equipment is in operation. Stop the machine and then remove the dough.

(2) Avoid contact with hot fat. Remember fat remains hot for some time after the heating elements are shut off.

(3) Take care when draining fat from the machine. Wipe up any spilled fat immediately to avoid accidents later.

d. Steam kettles.

(1) Guard against burns from escaping steam or from the metal sides of the kettles.

(2) Be sure the safety valve is always in proper working order.

(3) Avoid the splash of hot material when draining kettles, and immediately clean up any spill that occurs.

EXERCISE: Answer the following questions and check your responses against the ones listed at the end of this study unit.

1. When operating a mixing machine, be sure your hands are _____ before operating the starter switch.

2. What is the correct method for loading the rotating oven?

_____

_____

3. What procedure should be followed to free dough from the doughnut machine?

_____

_____

4. What safety feature on a steam kettle should be checked for proper operation before each use?

_____

SUMMARY REVIEW

Having completed this study unit, you now know the rules for cleanliness and personal health in a food service operation. You have learned the steps in proper care of bakery equipment, the principles of insect, rodent, mold, and food poisoning control, and the proper safety procedures for equipment used in the pastry baking area.

Answers to Study Unit #1 Exercises

Work Unit 1-1.

1. a. Keep your body clean.
   b. Wear clean white uniforms.
   c. Wash hands with soap and water before beginning work.
   d. Keep your hair well groomed and clean.
   e. Brush your teeth at least once each day.
   f. Keep your fingernails short and clean.
   g. Do not use common drinking cups, eating utensils, or toilet articles.
   h. Avoid coughing and sneezing.
   i. Do not smoke or chew gum or tobacco.
2. a. You should have a medical examination prior to assignment to duty.
   b. If daily inspection reveals any illnesses, personnel should be referred to the medical facility.
   c. Reexamination after illness or if absent for more than 30 days.

Work Unit 1-2.

1. a. Remove all dry ingredients with a soft-bristle brush.
   b. Use a cellulose sponge or disposable paper towel to remove grease and foreign matter from equipment.
   c. Wipe all equipment dry.
   d. Wash all detachable equipment parts.
   e. Clean all equipment after each use.
   f. Keep all refrigeration storage areas neat and clean.

Work Unit 1-3.

1. a. Disinfectants
   b. Insecticides
   c. Fumigants
2. a. Keep screens on all windows and other openings to the ouside in good repair.
   b. Seal all openings in building walls, floors, and ceiling.
   c. Cover all floor drains with fine metal screening or grating.
   d. Inspect incoming supplies daily.
3. b.

Work Unit 1-4.

1. a. Proper sanitation
   b. Cool storage area
   c. Dry storage
   d. Sunlight and proper ventilation
2. b.
3. d.
4. a. Use only specification ingredients.
   b. Thaw frozen eggs in cold running water not at room temperature.
   c. Store thawed eggs at 32-34°F.
   d. Keep ingredient containers covered.
   e. Do not reuse egg cans.
   f. Sterilize and sanitize mops and rags before reuse.
   g. Reduce ingredient and product handling to a minimum.
   h. Use seamless equipment to aid in cleaning.
   i. Heat cream fillings to 185°F to destroy germs.
   j. Add cream fillings to pie shells while still hot.
   k. Throw out leftover cream fillings. Do not mix with new filling.
   l. Store cream or custard filled products under refrigeration.
   m. Treat synthetic pie fillings as you would fresh fillings.

Work Unit 1-5.

1. a. Do not carry items in shirt pockets.
   b. Keep your mind on your work.
   c. Do not wear rings or other jewelry.
   d. Watch where you are walking.
   e. Eliminate slippery spots on the floor.
   f. Learn to lift properly.
   g. Report any unsafe conditions.
   h. Read and heed safety signs.
   i. Stay clear of moving equipment.
   j. Use the right utensils, equipment, and tools for the job.
   k. Keep all safeguards in place.
   l. Keep your work area clean.
   m. Get first aid promptly if injured.
   n. Use handling pads for hot objects.

Work Unit 1-6.

1. dry
2. When loading the rotating oven, load every other shelf and put pans in the oblong position.
3. Stop the machine and then remove the dough.
4. Safety valve

STUDY UNIT 2

PASTRY BAKING INGREDIENTS

STUDY UNIT OBJECTIVE: UPON SUCESSFUL COMPLETION OF THIS STUDY UNIT YOU WILL BE ABLE TO IDENTIFY THE TYPES OF FLOUR, WATER, SWEETENING, AND LEAVENING USED IN PASTRY BAKING. YOU WILL ALSO BE ABLE TO IDENTIFY THE EFFECTS OF SHORTENING, MILK, EGGS, SALT, AND MOLD INHIBITERS ON A BAKERY PRODUCT, THE METHODS OF MEASURING BY VOLUME AND WEIGHT, AND THE EFFECTS OF EMULSIFIERS AND THICKENING AGENTS.

To have the best tasting and best looking products in the bake shop, you must know your ingredients, how to check them for quality, how to store them, and, most importantly, how to use them in the recipe. Whether the ingredients are perishable or nonperishable, they should be rotated so that the oldest is used first. Without the proper rotation procedures, the spices, flavorings, and leavening agents tend to lose their ability to function properly and fail to give the results desired for pastry products.

Work Unit 2-1. FLOURS

NAME THE TWO TYPES OF FLOUR USED IN BAKERY PRODUCTION.

Flour is the principal ingredient used in the production of pastry items. It makes up the bulk of the ingredient mixture (except in cakes with a high sugar-to-flour ratio). The action of its components determines the structure and form of the finished products. For this reason, the baker should know the grade, composition, and characteristics of each type of flour available for his use. There are several types of wheat flour now being used by the Armed Forces. As stocks of some of these flours are exhausted, they will not be replaced. Eventually, you will be using only two types: bread flour and general purpose flour.

Bread flour. This flour is the hard wheat type and will replace other hard wheat flours once supplies are exhausted. It should be used only in bread baking.

General purpose flour. This flour is a blend of hard and soft wheat flours. It will replace cake, pastry, and soft wheat flour. Use this type of flour in all baking with the exception of bread baking.

All wheat flours are manufactured in different grades of which the most common used by the Armed Forces is straight flour. Wheat flour contains from 70 to 75 percent starch. The starch granules absorb water during fermentation and in the early part of the baking period and thus give bulk to the dough mass. The color of flour depends on the kind of wheat from which the flour was milled, the degree of refinement, and the bleaching process. The ability of flour to absorb water varies with the type and character of the wheat from which the flour was milled and the manner in which it has been stored.

When storing flour, store it away from items that can transmit odors to the flour. If possible, store flour in a separate room. If at all possible, store flour at uniform temperatures not higher than 70°F and at a relative humidity of 65 percent or less. When stacking flour, stack it on skids or dunnage at least five inches above the floor. Do not stack flour more than eight courses high. Place one additional sack on top, making a maximum of twenty-five sacks to a stack. In a low building or a tent, allow adequate space for air to circulate properly. Arrange flour so that the oldest can always be used first. Be sure that floor load limits are not exceeded when storing flour. Ensure all storage areas and racks are cleaned frequently. Sweep all areas on a daily basis to hold down rodent and insect infestation, and inspect areas daily.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the two types of flour used in bakery production.

   a. _____

   b. _____

2. In low buildings or tents, flour should be stored in a manner to let_____ circulate properly.

   a. heat
   b. air
   c. dust
   d. water

3. Flour should be arranged so that the _____ is used first.

Work Unit 2-2. WATER

NAME TWO TYPES OF WATER USED IN BAKING AND DESCRIBE THEIR EFFECT ON A PASTRY PRODUCT IN THE PREPARATION STAGES.

NAME THE TWO SOURCES OF WATER USED IN BAKING IN A CENTRAL PASTRY SHOP.

Water is needed mainly to dissolve the ingredients and distribute them evenly in the recipe. Water also combines with the protein in the flour to form gluten, giving the baked item structure. During baking, the water forms steam and helps the leavening agent. The remaining water adds moisture to the finished product and keeps it soft longer. When dough or water must be at a certain temperature, it is controlled by adjusting the temperature of the water used in the recipe.

Listed below are the two type of water used in pastry baking and the effects they have on the pastry product.

a. Soft water. Soft water is relatively free of dissolved minerals. When used in yeast-raised doughs, very pure or soft water has a tendency to soften the gluten and produce a sticky dough. Also, doughs made with soft water will ferment faster than those made with hard water. Therefore, the percentage of salt in the formula must be increased slightly when soft water is used. Salt strengthens the gluten and also retards the fermentation.

b. Hard water. Hard water contains appreciable amounts of dissolved minerals such as calcium, magnesium, and iron. If the minerals can be made to settle out by boiling, the water is said to be temporarily or slightly hard. If the minerals can be taken out only by chemical treatment, the water is said to be permanently hard. The temporarily or slightly hard water is the most desirable water to use in baking because the minerals in the water strengthen the gluten. The minerals in permanently hard water may slow fermentation in yeast-leavened products by excessively toughening the gluten. It may be necessary to increase the amount of yeast in the formula when using permanently hard water.

Listed below are two sources of water that will be available for use in the central pastry kitchen.

a. Installation water. The water used in baking must come from an engineer-approved source or be processed by an approved method. In a garrison bakery you should use the regular installation water that is available to you. In the field bakery your water may be supplied by a tank truck, or you may purify local water using your purification equipment.

b. Sea water. In an emergency, but only when authorized, you may use sea water. Most sea water contains 2 to 3 percent salt; bake a sample dough to determine the sea water's effect before adjusting your recipe. Refer to TM 5-7000, Field Water Supply, for additional information on water supplies.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the two types of water used in pastry baking.

   a. _____

   b. _____

2. Soft water is relatively free of _____.

3. What effect does soft water have on yeast-raised dough?

   _____

4. What effect does hard water have on yeast-raised dough?

   _____

5. Name two sources of water available for baking.

   a. _____

   b. _____

6. Sea water is used only when _____

Work Unit 2-3. SWEETENING AGENTS

NAME THE FIVE SWEETENING AGENTS USED IN PASTRY BAKING.

Sugars belong to a group of compounds called carbohydrates which are composed of carbon, hydrogen and oxygen. Some of the characteristics common to sugars are: sweet taste, dissolve easily in water, and ferment in solution. Sugar in bakery products is mainly used as a sweetenner, but it is also a tenderizer because it has a softening effect on flour proteins. Sugar caramelizes at a lower oven temperature during the baking process to give a darker color to the crust. Sugar also improves the keeping qualities of a baked item by retaining moisture. The following five sugars are used in the preparation of bakery goods.

a. Granulated Sugar. This sugar is the most common type of sweetening agent used in the preparation of baked items.

b. Powdered Sugar. This is a finely ground, compact powdery sugar used mainly in the preparation of frostings, icings, and glazes.

c. Brown Sugar. This is a type of sugar that is not as refined or as sweet as granulated sugar. It is used in baked items for its distinct flavor and color.

d. Molasses. This is a thick, brown liquid obtained in the sugar making process. It contains caramel and is used to flavor and color some cakes, cookies, and brown breads. Recipes calling for molasses have been adjusted to make up for its acidity and moisture.

e. Honey. This is a viscous liquid used in baking for its flavor. It also adds a chewy texture and causes a darker crust color.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. What is the primary effect of sugar in a pastry product? _____

2. What other effect does sugar have in a pastry product? _____

3. Name the five sweetening agents used in the preparation of bakery items.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

Work Unit 2-4. LEAVENING

LIST THE THREE TYPES OF LEAVENING AND GIVE AN EXAMPLE OF EACH.

Doughs and batters are lightened, or made to rise by leavening. Leavening puts tiny bubbles of gas into the dough or batter which give a light and spongy texture to the finished product. There are three types of leavening.

a. Physical. In the physical leavening process, air is incorporated in the dough or batter during the mixing process. Another source of physical leavening is the expansion of

moisture in the batter or dough, caused by oven heat. Usually physical leavening is combined with chemical or biological leavening. Physical leavening is used in a sponge or angel food cake where air is mixed into the ingredients to cause the batter to reach a desired volume.

b. Chemical. In chemical leavening, baking soda or baking powder is added to the dry ingredients in the recipe. Under certain conditions, the baking soda or baking powder produces carbon dioxide gas which causes the batter to expand. Batter type cakes are made using the chemical method of leavening.

c. Biological. In biological leavening, the enzymes in yeast convert sugar to carbon dioxide gas. Biological leavening is used in sweet dough mixes and occurs when the yeast is added to the ingredients and causes the batter to ferment and rise.

The important thing to remember about leavening is that it is necessary to use only the leavening method given by the recipe. Even though chemical and biological leavening each produce carbon dioxide gas, they should not be substituted for each other.

EXERCISE: Answer the following questions and check your answers with those listed at the end of this study unit.

1. List the three types of leavening used in the baking process.

   a. _____

   b. _____

   c. _____

2. One source of physical leavening is the expansion of _____ in the batter or dough caused by oven heat.

3. Baking soda and baking powder produce _____ gas which causes the dough to expand during the baking process.

4. In biological leavening, the enzymes in _____ convert sugar to carbon dioxide gas.

Work Unit 2-5. SHORTENING

STATE THE THREE EFFECTS SHORTENING HAS ON A BAKERY PRODUCT.

Shortening is made from animal fat, vegetable oil, or a blend of the two. Most shortening used in baking in the Armed Forces is made from vegetable oil. Butter is made from milk fat, but is not used very often in large scale bakery operations because of the expense. Vegetable oils are taken from seeds of oil bearing plants. The oil is then refined, filtered, and deodorized. Edible oil is changed into shortening by hydrogenation (adding hydrogen gas), just enough is added to give a workable consistency to the finished product. A bakery type shortening compound which contains an emulsifying agent is produced for use in batter type cakes. For best results, use hydrogenated shortening at a temperature of 70°F to 80°F.

Shortening causes three things to happen when it is incorporated into a dough or batter:

** Produces a soft velvety crumb.

** Tenderizes and moisturizes the baked items.

** Increases the volume of the dough or batter.

When shortening is solid at room temperature, it is called fat; when it is liquid, it is called oil. The mineral oil used for lubrication purposes in not a shortening.

EXERCISE: Answer the following questions and check your answers against those at the end of this study unit.

1. When shortening is solid at room temperature, it is called _____?

2. What three effects does shortening have on a dough or batter?

a. _____

b. _____

c. _____

3. Most shortening in the Armed Forces is made from _____ oil.

4. Edible oils are changed into shortening by _____

Work Unit 2-6. MILK

NAME THE THREE EFFECTS MILK HAS ON A BAKERY PRODUCT.

The word "milk," unless qualified, means the liquid whole milk that is obtained from cows. In its original state milk will not retain its freshness for long. For purposes of prolonging its keeping qualities and facilitating handling and storage, milk is packed in various concentrated forms. Examples are dry whole milk and nonfat dry milk. When properly handled, any of these may be used in pastry making. Liquid whole milk (fresh milk) is never used in baking because it spoils easily and is difficult to handle. Most milk used in baking is nonfat dry milk obtained by removing the fat and water from liquid whole milk. It contains lactose, milk proteins, and minerals in the same amounts as those found in fresh milk. If you need to substitute one milk for another, use the table of milk equivalents in section "A" of the Armed Forces Recipe Service.

There are three effects that the use of milk has on a pastry product.

a. Nutritional value. Milk adds to the nutritional value of a pastry product and enhances the flavor of the pastry item. Increased nutritional value is the most important effect of the use of milk on a pastry product.

b. Texture. Milk gives a soft, velvety texture to the finished pastry item. This occurs because the milk has a binding effect on the flour proteins which toughen the finished product.

c. Crust color. The sugars in milk give a richer color to the crust of finished pastry items.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the three effects that milk has on a pastry product.

a. _____

b. _____

c. _____

2. If you have to use the table of milk equivalents, use section _____ of the Armed Forces Recipe Service.

3. Most milk used in baking is _____ milk.

Work Unit 2-7. EGGS

NAME THE FIVE EFFECTS THAT EGGS HAVE ON A PASTRY ITEM.

The Armed Forces use three types of eggs. They are shell eggs, frozen whole eggs, and dehydrated eggs. Shell eggs may be fresh eggs or refrigerated storage eggs. Frozen whole eggs have been removed from the shell and frozen. Dehydrated egg mix is made by removing most of the moisture from eggs. To be able to substitute one type of egg for another, use the table of egg equivalents in section "A" of the Armed Forces Recipe Service.

Eggs are an important part of cakes, cookies, and sweet baked goods. The following five areas are affected in pastry items when eggs are used:

a. Volume. Eggs help to support the weight of sugar and shortening and keep the product from being heavy. In sponge type cakes, eggs are the main leavening agent because when whipped they hold air. The function of eggs as a leavening agent is probably the single most important contribution of eggs in pastry products.

b. Color. Egg whites and yolks contribute to the color of pastry items. For example, white cakes use egg whites and yellow cakes use the yolks.

c. Moisture. Since eggs are a semi-liquid material, they add moisture to many bakery items.

d. Flavor. The use of eggs in pastry products adds considerably to the overall flavor and richness of the pastry items.

e. Nutrition. The yolks of eggs contain vitamins A and D, thiamine, riboflavin, calcium, and iron. The use of eggs adds significantly to the nutritional value of the pastry product.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the five effects that eggs can have on pastry products.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. What is the most important contribution of eggs to pastry products?

   _____

3. What causes the yellow color of yellow cakes?

   _____

Work Unit 2-8. SALT

DESCRIBE THE EFFECTS OF SALT USED IN A BAKERY PRODUCT.

The salt used in baking is sodium chloride, usually called table salt. It is used in baked products to improve and intensify flavors. It also helps regulate the fermentation of the yeast in the dough products. Less salt means faster fermentation; more salt means slower fermentation. Salt also strengthens the gluten and makes it more stable. Store salt in a clean dry place where it can be kept free from dust and moisture. Too much moisture tends to cause salt to lump and harden.

EXERSICE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. What three effects does salt have on a bakery product?

   a. _____

   b. _____

   c. _____

2. Less salt causes _____ fermentation.

Work Unit 2-9. FLAVORING AGENTS

LIST THE FOUR CLASSES OF FLAVORING AGENTS.

For every type of pastry product, there is a flavoring or spice that is more appropriate than any other. Flavorings improve the taste of a product when you use them as directed by the recipe. The following are the four main classes of flavorings used in pastry baking.

a. Liquid flavoring. These agents are concentrated alcoholic solutions of a particular flavor. Lemon and orange flavorings are made from natural oils. Imitation flavors include almond, banana, cherry, black walnut, brandy, maple, pineapple, rum, and vanilla.

b. Dried spices and seeds. Spices come from the roots, seeds, fruit, or bark of certain flavor producing plants. The main spices of this type used in baking are cinnamon, cloves, mace, allspice, nutmeg, and ginger. Seeds such as caraway, poppy, and sesame are used in many yeast doughs.

c. Cocoa and chocolate. Both cocoa and chocolate are used to give a chocolate flavor. The main difference between the two is that the natural fat, cocoa butter, is partially removed from cocoa before the cocoa is powdered. Chocolate is in a solid form that is usually melted down before using.

d. Miscellaneous flavors. The other flavorings are listed as miscellaneous flavors and include juices, prepared fruits, oatmeal, coconut, peanut butter, nuts, raisins, and chocolate (chocolate chips) which are sometimes added to doughs and batters to produce particular flavors and textures.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. List the four classes of flavorings.

   a. _____

   b. _____

   c. _____

   d. _____

2. Black walnut is what type of flavoring? _____

3. Name the six commonly used spices.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

4. What is the difference between cocoa and chocolate?

   _____

5. Name four miscellaneous flavorings.

   a. _____

   b. _____

   c. _____

   d. _____

Work Unit 2-10. YEAST AND YEAST FOOD

STATE THE DEFINITION OF YEAST.

DESCRIBE THE USE OF YEAST FOOD.

Yeast is a microscopic one-celled plant. When yeast grows, it produces carbon dioxide gas and alcohol. The gas causes the air spaces in bread, while the alcohol gives the baking bread a pleasant odor. This action is called leavening. The leavening action gives the proper form and texture to breads and rolls. Active dry yeast is the most commonly used yeast for pastry baking in the Armed Forces. In this form the yeast cells are dehydrated, shaped into pellets and then packed in air-tight cans. This process destroys or damages many of the yeast cells, and only about half as many yeast cells remain alive and capable of growth. Due to water loss in drying, one pound of active dry yeast has about the same leavening power as two pounds of compressed yeast. Regardless of what form of yeast is used, follow the instructions on the can or package.

Yeast food is an ingredient which contributes to the action of the yeast and which improves the quality of any dough. Yeast food contains acid mineral salts which help condition soft water and help counteract alkaline water. Doughs made with yeast food are not sticky and therefore pass through the machinery easily. Other effects of using yeast food are faster fermentation, a larger proofed loaf, and improved crust color of the baked product.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. What is yeast?

   _____

2. What is added to yeast dough to avoid stickiness?

   _____

3. What effect does yeast food have on soft and alkaline water?

   _____

4. What is the effect of yeast food?

   _____

   _____

Work Unit 2-11. EMULSIFIERS

DESCRIBE THE EFFECT OF EMULSIFIERS ON BAKED ITEMS.

Emulsifiers, or bread softeners, are agents which produce bread or dough that will remain soft for a longer period of time. Emulsifiers are added to the dough during the mixing stage; the softening action takes place after the bread is baked. Under normal conditions, you will use one-half to three-fourths of a pound of emulsifier for each one hundred pounds of flour.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. What is the effect of emulsifiers on baked items? _____

   _____

2. Emulsifiers should be added to the dough during the _____ stage of pastry production.

   a. make up
   b. mixing
   c. proofing
   d. baking

Work Unit 2-12. MOLD INHIBITORS

LIST THE THREE MOLD INHIBITORS USED IN A BAKERY OPERATION.

Certain acid or alkaline ingredients can be added before baking to inhibit mold. Three common mold inhibitors are listed below. All three mold inhibitors are added to the dough along with the salt and sugar.

a. Sodium diacetate. This is an acid type inhibitor. Its use does not speed up fermentation enough to make changes in the recipe necessary.

b. Sodium propionate. This is a mold inhibitor which is alkaline. If you use this inhibitor, fermentation will slow down and you will need to adjust the recipe.

c. Calcium propionate. This is also a mold inhibitor that is alkaline. It produces the same results as sodium propionate, and you must adjust the recipe to allow for slower fermentation.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Mold inhibitors are added in the dough along with the

   a. salt and sugar.
   b. salt and flour.
   c. sugar and flour.
   d. sugar and water.

2. List the three mold inhibitors used in bakery operation.

   a. _____

   b. _____

   c. _____

3. What effect does sodium and calcium propionate have on fermentation?

   _____

Work Unit 2-13. THICKENING AGENTS

NAME THE TWO POWDERED THICKENING AGENTS USED IN FILLINGS FOR BAKED PRODUCTS.

When making pastry of any kind that has a filling which must be thickened, there are two common thickening agents that you might use. Both thickening agents are in a powdered form and may be used to thicken filling liquids to the right consistency.

a. Cornstarch. Cornstarch is cooked with a liquid until thick and clear.

b. Pregelatinized starch. This starch does not need to be precooked and you may add it with the other dry ingredients.

Both of these thickening agents should be in an airtight container when received; to avoid dampness store them in the dining facility storeroom at normal temperatures.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Name the two thickening agents used in pastry fillings.

   a. _____

   b. _____

2. In what form do the above thickening agents come?

   a. Liquid
   b. Dehydrated
   c. Powdered
   d. Solid

Work Unit 2-14. CREAM OF TARTAR

STATE THE USE OF CREAM OF TARTAR IN BAKED GOODS.

Cream of tartar is a baking acid which is used with baking soda as a leavening agent. When used without an alkali like baking soda, cream of tartar makes the dough or batter more acid. This extra acidity causes the sugar to caramelize at a higher temperature and gives a much whiter crumb and a lighter crust color to the finished product. Cream of tartar is also used in some syrups and frostings.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. State the use of cream of tartar in baked goods.

_____

2. Cream of tartar causes sugar to caramelize at a higher temperature and causes the pastry product to have a _____ crust color.

a. lighter
b. darker
c. whiter
d. brown

Work Unit 2-15. MEASURING INGREDIENTS

NAME TWO PROCEDURES USED FOR MEASURING INGREDIENTS.

MATCH THE MEASURING PROCEDURES FOR CERTAIN INGREDIENTS WHEN MEASURING FOR VOLUME.

Whenever you are producing a pastry item, one of the most important steps is measuring the right amount of all the ingredients that go into the product. If for any reason, the ingredients are wrong, you will produce a poor product. There are two specific ways that you can measure all the ingredients that go into pastry items.

a. Measuring by weight. Weighing is the more accurate means of measurement. Recipe ingredients should be measured by weight whenever possible.

b. Measuring by volume. This method should be used only if there are no scales available. Measuring devices include items such as cups, pitchers, dippers and ladles. When using measuring devices, there are certain rules you should observe, as listed below.

Flour	When specified, sift before measuring. Place flour lightly in measuring utensil. Level with straight edge of knife. Do not shake utensil; do not pack flour.
Sugar, granulated	Fill measuring utensil without shaking. Level with straight edge of knife. If sugar is lumpy, sift before measuring.
Sugar, brown	When specified, pack firmly into measuring utensil. If sugar is lumpy, roll with a rolling pin to break up any lumps before measuring.
Milk, nonfat, dry	Stir lightly with a fork or spoon. Place lightly in measuring utensil. Do not shake utensil. Level with straight edge of knife.
Baking powder and spices	Stir lightly with fork or spoon. Dip dry measuring spoon into container, bringing spoon up heaping full. Level with straight edge of knife.
Solid fats	Press fat firmly into measuring utensil. Level with straight edge of knife.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Name the two methods of measuring ingredients.

   a. _____

   b. _____

2. Weighing ingredients is _____ than measuring them by volume.

3. When scales are not available for measuring ingredients, you should use _____.

4. Match the ingredients in column 1 to the correct measuring procedure in column 2.

Column 1 Measuring procedures	Column 2 Ingredients
___ Fill measuring utensil without shaking. Level with straight edge of knife. If sugar is lumpy, sift before measuring.	a. Flour b. Sugar, granulated c. Sugar, brown d. Milk, nonfat, dry e. Baking powder and spices f. Solid fats
___ Stir lightly with a fork or spoon. Dip dry measuring spoon into container, bringing it up heaping full. Level with straight edge of knife.	
___ Stir lightly with a fork or spoon. Place lightly in measuring utensil. Do not shake utensil. Level with straight edge of knife.	
___ When specified, sift before measuring. Place lightly in measuring utensil. Level with straight edge of knife. Do not shake utensil; do not pack.	
___ Press firmly into measuring utensil. Level with straight edge of knife.	
___ When specified, pack firmly into measuring utensil. If lumpy, roll with a rolling pin to break up any lumps before measuring.	

SUMMARY REVIEW

Having completed this study unit you can name the two types of flour and water used in the pastry kitchen and are able to list the five sweetening agents and three types of leavening used. You also know the effects of shortening and milk on the finished pastry product and the importance of eggs in the product. You can list three mold inhibitors, two methods of measurement and two thickening agents, and can describe the effects of emulsifiers on baked products.

Answers to Study Unit #2 Exercises

Work Unit 2-1.

1. a. Bread
   b. General purpose
2. b.
3. oldest

Work Unit 2-2.

1. a. Hard
   b. Soft
2. dissolved minerals
3. Speeds up fermentation
4. Slows fermentation
5. a. Installation
   b. Sea
6. authorized

Work Unit 2-3.

1. Sweetens them.
2. Tenderizes them.
3. a. Powdered
   b. Brown
   c. Molasses
   d. Granulated
   e. Honey

Work Unit 2-4.

1. a. Physical
   b. Chemical
   c. Biological
2. moisture
3. carbon dioxide
4. yeast

Work Unit 2-5.

1. fat
2. a. Produces a soft velvety crumb
   b. Tenderizes and moisturizes the baked items
   c. Helps increase the volume of dough or batter
3. vegetable
4. hydrogenation

Work Unit 2-6.

1. a. Nutritional value
   b. Soft velvety texture
   c. Crust color
2. A
3. nonfat dry

Work Unit 2-7.

1. a. Color
   b. Flavor
   c. Moisture
   d. Nutrition
   e. Volume
2. Leavening agent
3. Egg yolks

Work Unit 2-8.

1. a. Imporves flavor
   b. Regulates fermentation
   c. Strengthens gluten
2. faster

Work Unit 2-9.

1. a. Liquid
   b. Dried spices and seeds
   c. Cocoa and chocolate
   d. Miscellaneous flavors
2. Liquid
3. a. Cinnamon
   b. Cloves
   c. Mace
   d. Allspice
   e. Nutmeg
   f. Ginger
4. The natural fat, cocoa butter is removed from cocoa.
5. a. Juices
   b. Prepared fruit
   c. Oatmeal
   d. Coconut
   e. Nuts
   f. Raisins
   g. Chocolate

Work Unit 2-10.

1. Yeast is a microscopic one-celled plant used to cause dough to rise.
2. yeast food
3. Conditions soft water; counteracts alkaline water.
4. Yeast food is an ingredient that contributes to the action of yeast and improves the quality of the dough.

Work Unit 2-11.

1. Emulsifiers produce bread or dough that will remain soft for a long period of time.
2. mixing

Work Unit 2-12.

1. a.
2. a. Sodium diacetate
   b. Sodium propionate
   c. Calcium propionate
3. They cause fermentation to slow down.

Work Unit 2-13.

1. a. Cornstarch
   b. Pregelatinized starch
2. c.

Work Unit 2-14.

1. Used with baking soda as a leavening agent.
2. a.

Work Unit 2-15.

1. a. By volume
   b. By weight
2. more accurate
3. measuring devices
4. b.
   e.
   d.
   a.
   f.
   c.

STUDY UNIT 3

PIES

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT YOU WILL BE ABLE TO INDENTIFY THE TYPES OF PIES, THE STEPS REQUIRED TO MIX A PIE DOUGH, THE METHODS AND PRINCIPLES OF ROLLING PIE DOUGH, THE TYPES OF PIE FILLINGS, AND THE FAULTS ENCOUNTERED IN PIE PRODUCTION.

Most pastry is baked in a garrison dining facility except at installations where a central pastry facility is available. When pastry baking in a garrison dining facility, you will be given the responsibility for producing a pastry product from start to finish; whereas, when pastry baking in a central pastry shop, you will be responsible for only one or two steps in the baking process. In both types of facilities you will have daily worksheets and product sheets to follow. These forms tell who produces the item or who works on the various stages of product preparation, what to do, when to start, how much to prepare, and what recipe should be used.

When making pies or other pastry, it is important that all ingredients be scaled properly. Avoid undermixing and overmixing. Always remember to use the correct type and size of pan; this helps to ensure that the correct portions are made and that the portion size is according to the recipe. Preheat the oven to the correct temperature, and avoid overbaking or underbaking. To get the best results when using a mix, follow the manufacturer's recipe. If you follow the above general rules when baking pastry, you will ensure the best possible pastry product.

Work Unit 3-1. TYPES OF PIES

NAME THE TWO BASIC TYPES OF PIES.

The Armed Forces Recipe Service has recipes for two basic types of pies. The first is the one-crust pie. It is made with an unbaked pie shell or a prebaked pie shell and a filling. Custard is baked in the crust at the same time the crust is baked. The prebaked shell fil- lings are precooked and then placed in the shells. These are often topped with meringue or whipped topping. Examples of these one-shell pies would include pumpkin, lemon meringue, chiffon, and any type of custard pie. The second type of pie in the Armed Forces Recipe Service is the two-crust pie, which is made with a top and a botton crust with filling in between. These fillings are baked in the pie at the same time the crust is baked. All fruit-filled pies are two-crust pies.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the two types of pies made from the Armed Forces Recipe Service.

   a. _____

   b. _____

2. An example of a one-crust pie is

   a. mince meat.
   b. cherry.
   c. lemon meringue.
   d. Boston-cream.

3. One-crust pies are usually topped with whipped topping or _____.

4. A good example of a two-crust pie is _____ pie.

   a. apple
   b. custard
   c. pumkin
   d. meringue

Work Unit 3-2. PIE DOUGH

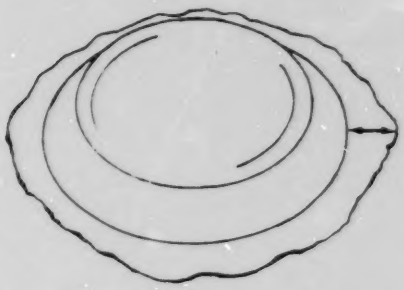
DESCRIBE THE TWO STEPS REQUIRED WHEN MIXING PIE DOUGH.

LIST THE TWO METHODS OF ROLLING PIE DOUGH.

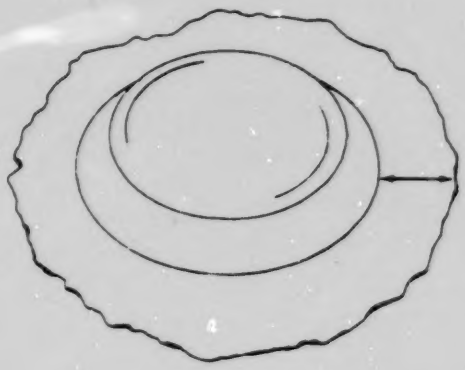
STATE THE TWO PRINCIPLES OF ROLLING PIE DOUGH.

Mix ingredients and follow the recipe carefully to get a tender pie crust. If you change the time, temperature, amount of ingredients or mixing methods given in the recipe, you will get a faulty crust. There are two steps involved in mixing pie dough. The first step is to blend all the dry ingredients with the shortening until the dough particles are the size stated in the recipe. The second step is to add the water and mix the dough until it is just formed. Roll the dough into a cylinder.

After the pie dough has been mixed and formed into a cylinder, it must be prepared for rolling. Before rolling, rest the dough for an hour or longer, preferably under refrigeration so that it will be easier to handle. Once this is done, scale it into pieces of the proper size, and shape these pieces into smooth balls. You are now ready for rolling the dough. There are two methods of rolling pie dough: rolling by hand and rolling by machine. When using the machine, the scaled balls of dough, after being chilled, are put in the machine. This produces circles of the desired thickness and diameter. When hand rolling pie dough, check the diameter by inverting the pie pan to be used on the rolled-out dough. The finished size of the circle will depend on whether it is to be a top or bottom crust. Figure 3-1 shows size of pie crust in relation to the pie pan.



1/2" to 1" To Crust

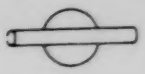


1 1/12" to 1 3/4" Bottom Crust

Fig 3-1. Sizing pie crust.

The following steps are used when rolling pie dough by hand.

1. Put rolling pin horizontally in the center of the shaped dough ball.

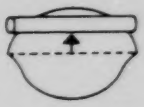


2. Roll away from the body to the edge of the dough. Lift the pin.

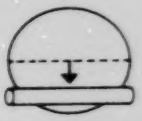
3. Put the rolling pin horizontally in the center of the dough. Roll towards the body to the edge of the crust. Lift the pin.

4. Turn the dough piece 90° and put the rolling pin horizontally in the center of the dough.

5. Roll away from the body to the edge of the dough. Lift the pin.



6. Put the rolling pin horizontally in the center of the dough. Roll towards the body to the edge of the dough. Lift the pin.



7. Without moving dough piece, place rolling pin diagonally in the center of the dough at a 45° angle.

8. Roll to the upper right to the edge of the dough. Lift the pin.

9. Put the rolling pin diagonally in the center of the dough at a 45° angle. Roll towards the lower left to the edge of the dough. Lift the pin.

10. Put the rolling pin diagonally in the center of the dough at a 45° angle.

11. Roll to the upper left away from the body to the edge of the dough. Lift the pin.

12. Put the rolling pin diagonally in the center of the dough. Roll to the lower right towards the body. Lift the pin. Measure for size and place in the pan.

Fig 3-2. Steps in rolling pie dough.

When rolling pie dough by hand, there are two principles that are to be followed. The first principle is that the dough must be rolled from the center to the edges. Since pie dough tends to thin out on the edges and remain thick in the center, you should counteract this by rolling from the center to the edges. The second principle is to turn the dough 90° after each rolling. Again this tends to produce a symmetrical and evenly thick rough form perfect for pie crusts. These two pinciples are shown in Figure 3-2.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. If you change the amount of ingredient given in the recipe for pie crust, you will produce a _____ crust.

   a. tastier
   b. better
   c. sweeter
   d. faulty

2. What are the two steps required for mixing the dough?

   a. _____

   b. _____

3. List the two methods used for rolling pie dough.

   a. _____

   b. _____

4. If you use a machine to roll pie dough, the dough must be

   a. chilled.
   b. frozen.
   c. warmed.
   d. rolled twice.

5. State the two pinciples for rolling pie dough.

   a. _____

   b. _____

Work Unit 3-3. PANNING THE PIE DOUGH

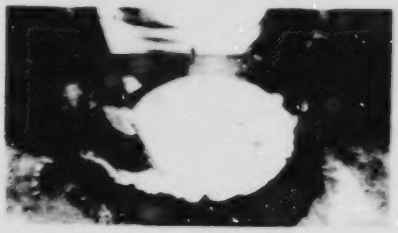
LIST THE STEPS IN PANNING THE PIE DOUGH FOR THE ONE-CRUST AND TWO-CRUST PIE.

STATE WHY PIE WASHES ARE USED.

After rolling the pie dough, the next step in the process of pie making is to pan the dough. To pan the dough for a baked one-crust pie shell, size one pie-crust circle and follow the steps in figure 3-3.

1. Dock the sized pie crust circle. Docking the pie dough puts holes in dough to prevent a puffy crust.

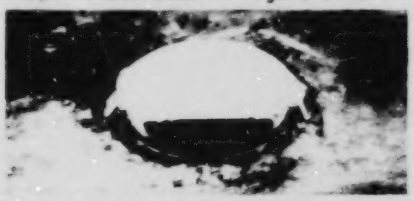
2. Fit the docked dough to the sides and bottom of the pan to prevent pockets of air.



3. Trim the excess crust with fingers or a dough scraper.

Fig 3-3. Panning dough for the one-crust pie.

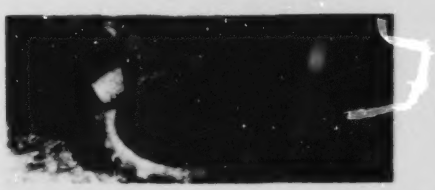
To pan the dough for a two-crust pie, size the two pie crusts as required and follow the steps illustrated in figure 3-4.



1. Fold the dough circle in half, pick it up, and place it on an ungreased pie pan.

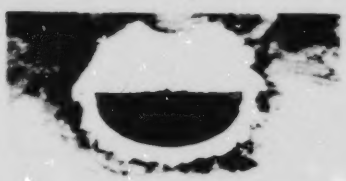
2. Unfold the dough and fit it in the pan.

3. Add the desired filling.



4. Brush the outer rim of the bottom crust with water.

5. Fold in half the dough circle to be used for the top crust and dock it to allow steam to escape during baking.



6. Place the folded top crust over the filling and unfold it.

7. Press the edges together and trim the excess crust.

Fig 3-4. Panning the two-crust pie.

After the dough has been panned for the two-crust pie, the pie wash must be applied. Using a pie wash on top the two-crust pie gives it the desired color. Brush the crust using a wash made from one of the recipes in the Armed Forces Recipe Service. Do not use too much wash or your pie may have a varnished look or be soggy in spots. The rim of the crust should never be washed or it may look burnt after baking.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. List the three steps to panning pie dough for the one-crust pie.

   a. _____

   b. _____

   c. _____

2. List the seven steps to panning pie dough for the two-crust pie.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

e. _____

3. In preparing pie dough, the bottom crust is placed in a(an) _____ pan.

a. ungreased
b. floured
c. wet
d. greased

4. The top crust is docked to allow _____ to escape during baking.

a. juice
b. filling
c. steam
d. air

5. On the one-crust pie the dough is fitted to the sides and bottom of the pan to prevent

a. air pockets.
b. the juice from leaking.
c. sticking.
d. burning.

6. State why pie washes are used.

_____

Work Unit 3-4. PIE FILLINGS

NAME THE FOUR TYPES OF PIE FILLINGS.

NAME THE TWO BASIC TYPES OF MERINGUE.

There are a variety of pie fillings that can be used when making pies. They are used with both the one-crust and two-crust pie. The four basic types of pie fillings are: (a) fruit, (b) cream, (c) chiffon, and (d) custard.

a. Fruit fillings. Fruit is used as a filling with two-crust pies and may be made from fresh, canned, frozen, or dehydrated fruits. In most dining facilities or central pastry kitchens, fruit fillings now come already prepared. For fillings that are not pre-prepared, you will find instructions in the Armed Forces Recipe Service. If you have to prepare the filling yourself, be sure to cool the filling before putting it into the crust; this will prevent boil-out and soggy crust. Fill crusts according to the recipe.

b. Cream. Cream filling is prepared in advance and then placed in prebaked pie shells. When making the filling, you must be careful not to bring the mixture to a boil; boiling will cause the mixture to curdle. Pour 2 3/4 to 3 cups of filling in each shell according to the re- cipe used; then place pies in refrigerator to chill. Keep pies chilled until ready to serve.

c. Chiffon. Chiffon filling is also prepared in advance and then put into a prebaked pie shell. A chiffon filling is made by making any type of gelatin and blending it thoroughly with dessert topping (whipping cream). Put the prescribed amount of filling in each shell. Place the pies under refrigeration for approximately 2 hours and serve them chilled.

d. Custard. Custard pies should not be prepared during warm weather due to the danger of con- tamination and spoilage. Custard fillings are uncooked, placed in unbaked shells, and then baked. Start by putting a small amount of filling in each shell; then finish filling. This keeps the crust from buckling. Bake at the specified temperature. If a custard pie is baked at too high a temperature or for too long a time, it will blister. Overbaking can cause the pies to curdle or crack.

Meringue is used on some one-crust pies not as a filling but on top of a filling as a topping. It can be made from egg whites from fresh shelled eggs or from meringue powder. Most facilities have meringue powder available. In this form it is economical, reliable, and easy to store. There are two types of meringue which can be made from fresh eggs.

a. Uncooked Meringue. Beat the egg whites to a foam or peak and add the sugar gradually. Continue beating until the mixture is smooth and will stand up in peaks when the beater is removed. Then add the the other ingredients specified by the recipe.

b. Cooked Meringue. Cooked meringue is made with hot syrup (238°F) which takes the place of sugar. It is poured in a heavy, thread-like stream into the beaten egg whites as they are beaten at a medium speed. This meringue is less likely to crack, leak, or shrink then the uncooked meringue, and its volume is nearly double.

Spread the meringue evenly over the filling, covering it completely to the outer edge of the crust. Ensure that the oven temperature is correct according to the Armed Forces Recipe Service to prevent the meringue from pulling away or shrinking.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. Name the four types of pie fillings.

   a. _____

   b. _____

   c. _____

   d. _____

2. Fruit pie filling is used with _____ pies.

   a. custard filled
   b. two-crust
   c. chiffon filled
   d. one-crust

3. Cream filling for pies should not boil since it will _____.

4. Chiffon filling is made with gelatin and _____.

5. Cream and chiffon pies should be served _____

6. Name the two basic types of meringue.

   a. _____

   b. _____

7. The difference between the cooked and the uncooked meringue is that cooked meringue is made with _____.

8. If the oven temperature is not correct, the meringue will _____.

Work Unit 3-5. PIE CRUST AND FILLING FAULTS

LIST THE PIE CRUST FAULT KEYWORDS AND MATCH SPECIFIC FAULTS TO THEIR POSSIBLE CAUSES.

LIST THE PIE FILLING FAULT KEYWORDS AND MATCH SPECIFIC FAULTS TO THEIR POSSIBLE CAUSES.

A pie crust fault usually results from a mistake made in the the mixing process. The mistake does not show up until the second mixing step or until the pie crust is baked. For example:

UNDERMIXING in the first step means that you will have to add more water in the second step for a workable dough. The added water results in a baked crust that is tough, has a pale color, and shrinks too much.

OVERMIXING in the first step, using the correct amount of water, means that more flour has to be added in the second step for a workable dough. Do not add too much flour, however, or the baked crust will be tough.

There are three keywords that are used in determining pie crust faults. These words are condition, color, and symmetry of the pie crust. Listed in figure 3-5 are some of the faults of pie crust.

CONDITION	POSSIBLE CAUSES
Too tough	Undermixed--1st step Not enough shortening Too much flour Too much water Rolled too much during makeup Too much dusting flour Too much scrap dough Too much flour
Soggy	Too much shortening Wrong flour (soft) Filling too hot Filling too thin Underbaked Too much top heat Too much wash Undermixed--2d step
Too tender	Too much shortening Wrong flour (soft) Overmixed--1st step Not enough water Undermixed-2d step
COLOR	**POSSIBLE CAUSES**
Too dark	Oven temperature too high Overbaked Too much wash Too much sugar or milk
Too pale	Cold oven Underbaked Crust too thin No sugar or milk No wash used Dough overmixed Filling too thin Not enough filling
Spotted	Too much dusting flour Undermixed--1st step Oven temperature too high Sugar or milk not blended properly Filling spilled on crust Undermixed--2d step Filling boiled out
SYMMETRY	**POSSIBLE CAUSES**
Excess shrinkage	Overmixed--1st step Overmixed--2d step Rolled too much during makeup Dough improperly trimmed Too much dusting flour Not enough shortening Too much flour

Fig 3-5 Pie crust faults.

The three keywords that aid in determining tne faults of pie fillings are consistency, color, and eating qualities. In figure 3-6 the characteristics of fillings and the causes of these faults are listed. Always remember to follow the recipe card exactly and to read and understand it thoroughly before starting to prepare the product.

CONSISTENCY	POSSIBLE CAUSES
Too thick	Too much starch Not enough water or juice Not enough sugar Overcooked Too many eggs (cream or custard fillings) Overbaked
Too thin	Not enough starch Too much water or juice Undercooked Too much sugar Not enough eggs (cream or custard fillings) Acid added too soon (tartaric or citric juice) Improper mixing procedure Too much acid
Separation of liquid (lemon pies)	Not enough acid (lemon juice) Stored under refrigeration Cooled too rapidly Improper sequence of adding ingredients
Cracks	Filling overcooked Too much starch Too many eggs Not enough fat Not enough sugar Not enough water Pies overbaked
Curdles	Milk about to sour Pie overbaked Filling improperly cooked Too much acid
Lumpy	Eggs added improperly Improperly reconstituted milk Filling cooled too long before it is placed in shell

COLOR	POSSIBLE CAUSES
Pale	Too much starch Fermented fruit Poor grade of fruit Not enough eggs Crushed fruit in filling Improper sequence of adding ingredients

EATING QUALITIES	POSSIBLE CAUSES
Starchy	Self-evident
Salty	Self-evident
Sweet	Self-evident
Spicy (Bitter)	Self-evident
Sour	Self-evident
Watery	Self-evident
Egg flavor	Self-evident
Acidic	Self-evident
Bland	Lack of salt or sugar
Rancid	Old shortening, butter or margarine
Tough	Too much starch
Rubbery	Overcooked Overbaked

Fig 3-6. Pie filling faults.

EXERCISE: Answer the following questions and check your answers against those listed at the end of this study unit.

1. List the three keywords that aid in determining pie crust faults.

   a. _____

   b. _____

   c. _____

2. Match the following pie crust faults to their possible cause.

____ Soggy	a. Too much dusting flour
____ Too tough	b. Dough trimmed unproperly
____ Spotted	c. Not enough shortening
____ Too pale	d. Too much shortening
____ Excess shrinkage	e. Cold oven

3. List the three keywords that aid in determining pie filling faults.

   a. _____

   b. _____

   c. _____

4. Match the following pie filling faults to their possible cause.

____ Too thin	a. Cooled too rapidly
____ Separation of liquids	b. Poor grade of fruit
____ Curdles	c. Too much starch
____ Pale	d. Milk about to sour
____ Bland	e. Not enough starch
____ Tough	f. Lack of salt or sugar

SUMMARY REVIEW

In this study unit you have learned the two basic types of pies made from the Armed Forces Recipe Service, the two steps in mixing and two methods of rolling pie dough, and the two principles involved in rolling pie dough. You also have learned the four types of pie filling and can give the keywords used to determine pie crust and filling faults.

Answers to Study Unit #3 Exercises

Work Unit 3-1.

1. a. One-crust
   b. Two-crust
2. c.
3. meringue
4. a.

Work Unit 3-2.

1. d.
2. a. Blend dry ingredients with shortening.
   b. Add water and mix.
3. a. Hand rolling
   b. Machine rolling
4. a.
5. a. Roll from center to the edges.
   b. Rotate the dough at 90° after each roll.

Work Unit 3-3.

1. a. Dock the pie crust
   b. Fit the docked dough to the sides and bottom of pans
   c. Trim the excess crust from the pan
2. a. Fold dough circle in half, place in ungreased pan
   b. Unfold dough and fit in pan
   c. Add filling
   d. Brush outer rim of crust with pie wash
   e. Fold top dough in half, dock
   f. Place on top of pie and unfold
   g. Press edges together and trim crust
3. a.
4. c.
5. a.
6. A pie wash gives the product a desired color.

Work Unit 3-4.

1. a. Fruit
   b. Cream
   c. Chiffon
   d. Custard
2. b.
3. curdle
4. dessert topping
5. chilled
6. a. Cooked
   b. Uncooked
7. hot syrup instead of sugar.
8. shrink.

Work Unit 3-5.

1. a. Condition
   b. Color
   c. Symmetry
2. d.
   c.
   a.
   e.
   b.
3. a. Consistency
   b. Color
   c. Eating qualities
4. e.
   a.
   d.
   b.
   f.
   c.

STUDY UNIT 4

CAKES

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT, YOU WILL BE ABLE TO IDENTIFY CAKE INGREDIENTS, THE STEPS IN PREPARING CAKES, AND THE CAKE FAULTS TO BE AVOIDED.

The Armed Forces Recipe Service gives recipes for two types of cakes. These types are batter type cakes, such as white and yellow cakes, and sponge type cakes such as angel food, which depend on the incorporation of air for texture and volume. When making cakes, it is very important for certain conditions to be observed. These conditions include the proper temperature of ingredients, correct time for beating at each stage of mixing, proper preparation of pans, proper amount of batter in each pan, and a preheated oven. Also, having the correct oven temperature and removing the cake properly from the oven and the pan is very important. The guidelines to follow are set forth in the "G" section of the Armed Forces Recipe Service. Follow these and you will end up with a finished product that will be tasty and appealing.

Work Unit 4-1. CAKE INGREDIENTS

LIST THE EIGHT INGREDIENTS NEEDED TO PREPARE A BASIC CAKE BATTER.

You can make a cake from basic ingredients or from a prepared cake mix. Mixes come in several varieties such as white, yellow, devil's food, gingerbread, pound, angel food and banana cakes. They are listed in Federal Supply Catalog Group 89. You can vary these mixes by adding other ingredients as suggested in the Recipe Service.

When baking cakes at altitudes above 2,000 feet, you must make certain adjustments in the amount of leavening, pan preparations, and oven temperatures. You will find instructions for making adjustments in the Armed Forces Recipe Service or in the canned mixes. With canned cake mixes there are separate leavening packets; follow their instructions for adjustments.

To make a basic cake batter, the following eight ingredients should be used:

a. Flour is the chief structure builder in most cakes. The type of flour used in the Armed Forces is general purpose flour. It is a soft wheat flour which is capable of forming a soft-yielding gluten which aids in the tenderness of cakes. The gluten formed during the mixing process coagulates during the baking process and helps to support the weight of the heavier ingredients such as sugar and shortening. If it becomes necessary to use a hard wheat type of flour for cakes, a better product will result by substituting cornstarch for a part of the flour (up to 10 percent). Increasing the starch content of the batter will decrease the protein content of a cake.

b. Sugar is used in cakes as a sweetener. It tenderizes, adds to the color of the cake's crust, improves keeping quality, and cuts air into the batter. Sugar should be completely dissolved in the cake batter. Four factors that govern the dissolving of sugar are the mixing time, the mixing temperature, the size of the sugar crystals, and the amount of moisture in the mix.

c. Salt is used primarily to impart flavor or bring out the natural flavors of other ingredients. It also prevents excessive sweetness in the cake.

d. Shortening functions in cake batter to improve eating quality, to aid in producing volume, and to enhance the freshness of cakes. Shortening with emulsifying agents should be used so as to mix more completely with other liquid ingredients.

e. Eggs provide structure, moisture, flavor, color, and food value in cakes. Air incorporated in the eggs during mixing assists in leavening. In foam-type cakes, eggs are the primary leavening agent. Structure, the most important contribution, is provided by the coagulation of the egg proteins during the baking process.

f. Milk adds nutritive value and flavor, and aids in controlling crust color. Milk can be added in nonfat dry, evaporated, or reconstituted form. The desired crust color of the product results when the milk sugar caramelizes at low oven temperatures.

g. Leavening contributes tenderness to cakes. The type of leavening used depends on the type of cake being prepared, the richness of the formula, the consistency of the batter, and the baking temperature. Rich formulas use less chemical leavening, need lower oven temperatures, and have more air incorporated during mixing. Lean formulas need to use more chemi-

cal leavening, higher oven temperatures, and have less air incorporated during mixing. Baking soda is used to neutralize the acidity of acid ingredients such as molasses, buttermilk or sour milk. The use of too much soda will cause the product to have a soapy taste. Remember that high altitude baking requires adjustment to the leavening.

h. Flavorings are used to provide particular flavor to the cakes. Since the amount of flavoring used affects the finished product, use good judgment in selecting the flavoring used and weigh the flavoring accurately.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the eight ingredients used to make a basic cake batter.

a. _____ e. _____
b. _____ f. _____
c. _____ g. _____
d. _____ h. _____

2. How many basic type cakes are there?

a. 3 c. 7
b. 5 d. 8

3. What two types of cakes are made from the Armed Forces Recipe Service?

a. _____
b. _____

Work Unit 4-2. CAKE PREPARATION

LIST THE FIVE STEPS OF CAKE PREPARATION.

When making any product in the central pastry shop there are certain procedures that must be followed. There are five steps in preparing cakes from the mixing stage to the finished product. Listed below are the five steps of cake preparation.

a. Mixing. When mixing batter type cakes, the two-stage method is the preferred method because it is simple and there is less likelihood of error. The size of the mixing bowl is determined by the amount of batter to be made. There should be just enough batter in the bowl to cover the mixing paddle. The shortening to be used should not be too hard or too soft. After mixing, the temperature of the batter should be 72° F to 78° F. Described below is the two-stage method of mixing the batter.

When using the two-stage method of mixing, all dry ingredients must be sifted together twice. Place all dry ingredients, shortening, milk, and the main portion of water into the mixing bowl. Mix at a low speed, which prevents splashing, until all ingredients are combined. Then mix at a medium speed for three minutes. Stop, then scrape bowl thoroughly. Scraping the bowl periodically keeps dry ingredients from sticking to the bowl.

After the above steps have been accomplished, combine eggs, remaining water, and flavoring. Add these slowly to the ingredients in mixing bowl while mixing at low speed. Stop; scrape bowl thoroughly. Continue to mix at medium speed for three more minutes. Once this is done, the mix is ready to be panned. In most central pastry shops canned cake mixes are widely used. When using these mixes, follow the manufacturer's instructions for mixing the cake. These instructions will yield the best possible product. When in doubt about the proper mixing procedure for any cake product, refer to the "G" section of the Armed Forces Recipe Service.

b. Panning. When panning cake batter, always use the type and size of cake pan required. Use pan preparation instructions given in the recipe or in the directions on the container. Cake pans may be left ungreased or greased with or without a liner. They may be greased with a mixture of flour and shortening which is known as "dobie." If the weather is cold, dobie does not spread easily, but it can be warmed before using. (See figure 4-1 for preparing pan with dobie.) Follow the panning instructions for the amount of batter required per pan. Scale or measure the batter and spread it evenly in the pan. See figure 4-2. Remember that weights are more accurate than measures. When putting the batter in the pan, scrape the scale scoop or the measuring device clean of batter so you can maintain accuracy.

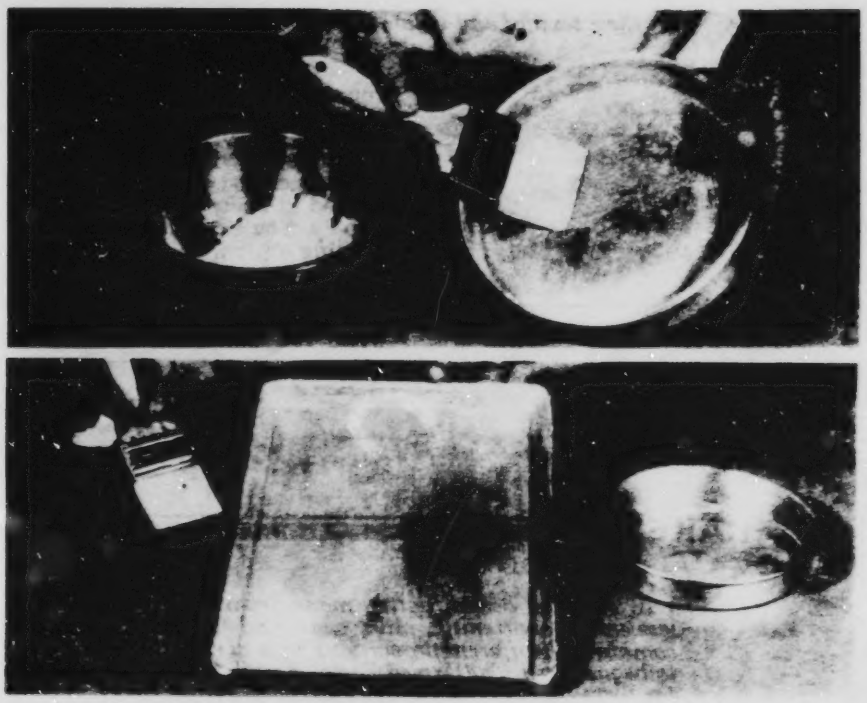


Fig 4-1. Preparing a pan with dobie.

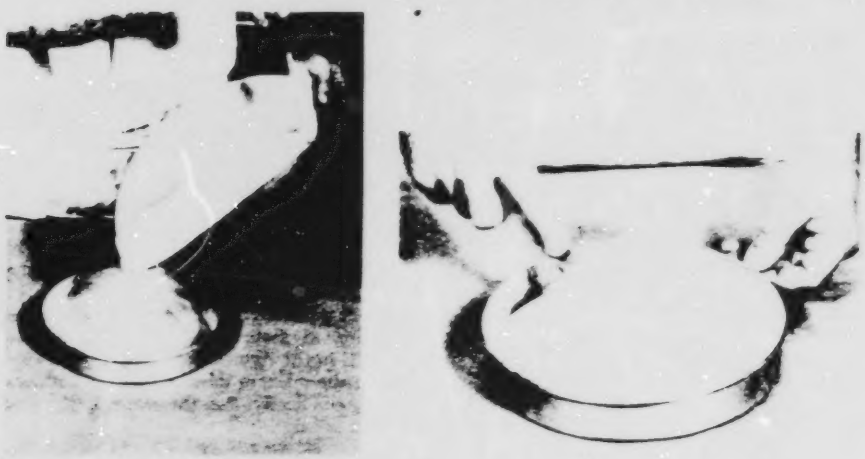
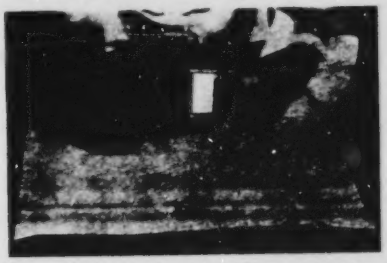


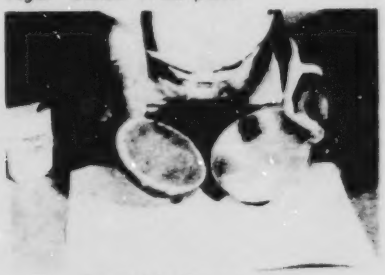
Fig 4-2. Panning batter for a layer cake.

c. Baking. Having mixed and panned the batter, baking is the next step in cake preparation. Bake the cake at the temperature shown in the recipe. Use an oven thermometer occasionally to make sure the oven temperature is accurate and even throughout. By doing this you also aid in keeping the maintenance of the oven by getting control errors corrected. Place the pans in the oven with room for air to circulate. If using a rotating oven, be sure to check the shelves occasionally to ensure that they are level. Be careful not to jar the pans during the baking process or the cakes may fall. Bake the cake for the amount of time prescribed in the recipe. To test the degree of doneness of the cake, lightly touch the cake near the center. If an indentation remains, the cake is not done. Bake it another three to five minutes and retest it.

After the cake is baked, remove it from the oven and place it on a rack to cool for ten minutes. Turn layer cakes onto paper dusted lightly with cornstarch or powdered sugar. When using cornstarch, keep in mind too much can cause a bitter taste. Granulated sugar can be used but will cause the frosting to be grainy. Turn out sheet cakes onto inverted pans covered with paper and dusted lightly with cornstarch or powdered sugar. Check the Armed Forces Recipe Service for instructions on removing jelly rolls and pineapple upside-down cakes. See figure 4-3 for removal of sheet or layer cakes from pan.



Dusting with cornstarch or powdered sugar.



Removing layer cake.

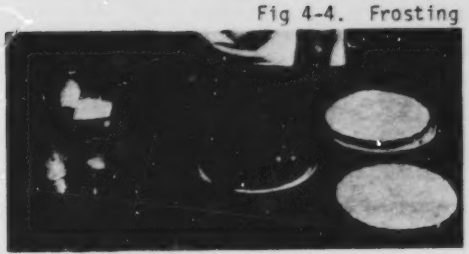
Removing sheet cake.

Fig 4-3 Removal of sheet and layer cakes from pan.

d. Frosting. Frostings give cake eye appeal and improve taste. They also improve the keeping quality of the cake by slowing the loss of moisture. Once a cake has been removed from the oven and cooled, it should be frosted as soon as possible to help hold its moisture. If the cake is still warm when you frost it, moisture may condense between the crust and frosting and the crust will become soggy. Cooked or uncooked frosting may be used, depending upon the recipe. Chocolate and vanilla frosting mixes are available. If a frosting is too stiff, it usually may be thinned by adding water or syrup, or by warming the frosting. A marshmallow type frosting should not be thinned. Adding water slows down drying of the frosting. When using flavorings in frosting, the flavor should complement the cake, not detract from it. Thus you should use only the amount of flavoring that is needed. If a colored frosting is desired, it is best to mix the food coloring with a small amount of frosting and then add the colored frosting to a larger amount of uncolored frosting until the desired color is obtained. When making a foam-type icing, meringue powder may be used for egg white. Follow the directions on the can and use a volume of powder and water equal to the volume of unbeaten egg whites. For further guidance on cake frosting, refer to the Armed Forces Recipe Service. Remember the importance of following recipes exactly.

e. Finishing. The final step of cake preparation is finishing the product. Cakes may be finished in either layer or sheet cake form. To start you must first remove all loose crumbs and if necessary trim the cake using a sharp knife to remove any hard or jagged edges. The finished product may be a 9" layer cake, two sheet cakes, or one sheet cake cut in half. When frosting a layer cake, invert the bottom with the top side down, placing the thicker layer on the bottom. Using a spatula, spread frosting evenly over the bottom layer. Cover with the top layer, top side up. Starting from the center and working outward, spread frosting on the top of the cake; then frost the sides. (See fig 4-4). Decorate the cake as desired and serve. You may leave sheet cakes in a pan and frost them only on top or finish them with nut toppings, coconut, cherries, or chocolate chips. Pineapple upside-down cakes need no finishing because the topping is baked on the cake. Boston cream pie is made from a split layer cake with a cream filling between the halves and a chocolate frosting or powdered sugar on top. (See fig 4-5)

Fig 4-4. Frosting a layer and sheet cake.



Cutting layer cakes.

Filling pie with cream.

Fig 4-5. Preparing and finishing Boston cream pie.

Finishing with chocolate frosting.

Finishing with powdered sugar topping.

Fig 4-5. Preparing and finishing Boston cream pie -- (continued).

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the five steps of cake preparation.

   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

2. What is the simplest method of mixing cake batter?

   _____

3. Pans may be greased with a flour and shortening mixture called _____

4. How is a cake tested for doneness?

   _____

5. Frosting a cake improves what three characteristics?

   a. _____
   b. _____
   c. _____

6. What type of cake product needs no finishing?

   _____

Work Unit 4-3. CAKE FAULTS

LIST THE CAKE FAULT KEYWORDS AND MATCH SPECIFIC FAULTS TO THEIR POSSIBLE CAUSES.

During the preparation of cake in the central pastry shop, it is possible to have something go wrong with the product. When determining the faults of cakes, there are five keywords or categories under which the faults are listed. These keywords are volume, symmetry, color, grain, and eating quality of a cake. Shown below are the five categories along with the faults and possible causes of each (fig 4-6).

VOLUME	POSSIBLE CAUSES
Too large	Too many eggs Too much leavening Wrong shortening Too much dry skim milk Too much batter in pan
Too small	Not enough leavening Not enough eggs Not enough shortening Not enough sugar Too much water Too much sugar Hard flour Oven too hot Underbaked Overbaked
SYMMETRY	**POSSIBLE CAUSES**
Flat	Too much water Too much shortening Too much leavening Not enough leavening Hard flour Oven temperature too low
Concave (dropped in center)	Too much sugar Too much leavening Too much shortening Wrong shortening Not enough eggs Not enough water Underbaked
Convex (peaked)	Too many eggs Too much flour Not enough sugar Not enough shortening Oven too hot
COLOR	**POSSIBLE CAUSES**
Crust too dark	Oven too hot Overbaked Too much top heat Too much sugar Too much shortening Too many eggs Too much milk Wrong leavening Not enough water Hard flour
Crust too light	Oven temperature too low Underbaked Not enough leavening Wrong leavening Not enough sugar Not enough milk Not enough shortening Not enough eggs Too much flour Too much water
Crust spotted	Improper mixing Too much sugar

Fig 4-6. Cake faults.

GRAIN	POSSIBLE CAUSES
Coarse or open grain	Too much leavening Too many eggs Wrong shortening Not enough water Hard flour Oven temperature too low
Dense or close grain	Not enough leavening Not enough eggs Not enough sugar Not enough shortening Too much shortening Wrong shortening Too much liquid Oven too hot
Large holes (tunnels)	Oven too hot Wrong shortening Improper mixing Too much sugar Not enough sugar
Crumbly texture	Too much leavening Too much sugar Too much shortening Too much flour Wrong flour Not enough eggs Not enough water Too much water Oven temperature too low Overbaked
Tough texture	Too many eggs Too much water Too much flour Too much milk Not enough leavening Not enough shortening Not enough sugar Oven too hot Oven temperature too low
Texture too tender	Too much leavening Too much sugar Too much shortening Not enough flour Not enough water Not enough eggs Oven temperature too low

EATING QUALITIES	POSSIBLE CAUSES
Too sweet	Self-evident
Too salty	Self-evident
Too eggy	Self-evident
Too bland	Not enough salt Not enough flavoring Not enough sugar

Fig 4-6. Cake faults - - (continued)

Too dry	Too much leavening Overbaked Not enough eggs Not enough liquid Oven too hot Oven temperature too low

EATING QUALITIES (continued)	POSSIBLE CAUSES
Greasy	Self-evident
Burnt	Self-evident
Tough	Not enough sugar Not enough leavening Not enough shortening Too much flour Too many eggs Eggs underbeaten Batter overmixed Batter undermixed

Fig 4-6. Cake faults -- (continued)

To have the proper volume, right symmetry, color, grain texture and good eating qualities, follow the recipe carefully whether it comes with the Armed Forces Recipe Service or is a manufacturer's recipe. If faults occur, refer to the above chart and analyze the problem.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the five keywords used in determining faults in cake products.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

2. Match the following faults in cakes with their possible cause.

   _____Crust too dark
   _____Coarse grain
   _____Taste bland
   _____Cake peaked
   _____Volume too small

   a. Too much flour
   b. Not enough salt, sugar, or flavoring
   c. Not enough leavening
   d. Too much leavening
   e. Too much sugar

SUMMARY REVIEW

Having completed this study unit, you are now able to identify cake ingredients. You also know the five steps of cake preparation and can list the keywords that aid in determining cake faults.

Answers to Study Unit #4 Exercises

Work Unit 4-1.

1. a. Flour
   b. Sugar
   c. Salt
   d. Shortening
   e. Eggs
   f. Milk
   g. Leavening
   h. Flavoring
2. a.
3. a. Batter
   b. Foam

Work Unit 4-2.

1. a. Mixing
   b. Panning
   c. Baking
   d. Frosting
   e. Finishing
2. Two-stage method
3. dobie
4. Touch the center; if it springs back it is done.
5. a. Taste
   b. Eye appeal
   c. Keeping quality
6. Pineapple upside-down cake

Work Unit 4-3.

1. a. Volume
   b. Symmetry
   c. Color
   d. Grain
   e. Eating qualities
2. e.
   d.
   b.
   a.
   c.

STUDY UNIT 5

COOKIES

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT, YOU WILL BE ABLE TO IDENTIFY THE THREE BASIC COOKIE TYPES, THE MAKEUP OF THE DOUGH FOR EACH TYPE, THE FINISHING OF BAR COOKIES, AND THE COOKIE FAULTS TO BE AVOIDED.

Cookies give variety to the menu and may be served alone or in combination with ice cream, pudding, or fruit. Because of their excellent keeping qualities, cookies can be prepared ahead of serving time. Cookies are made of four basic ingredients: flour, sugar, shortening, and liquid (milk and/or eggs). The color, quality, and size of most cookies are determined by the leavening agent used in the dough or batter. Flavor and texture are provided by other ingredients added to the mix. It is important to follow all recipe instructions to get the best quality in the finished product.

Work Unit 5-1. TYPES OF COOKIES

LIST THREE TYPES OF COOKIES.

There are two basic kinds of cookies--hard and soft. The two characteristics of good soft cookies are moisture and softness. Soft cookies contain a maximum amount of moisture and may require a greater percentage of eggs to produce the necessary structure. The characteristics of good hard cookies are crispness and brittleness. Hard cookies contain a minimum amount of moisture. Whether preparing hard or soft cookies there are three basic types of cookies that are made from cookie dough or batter. Listed below are the three types of cookies.

a. Drop cookies. These are cookies made from a soft dough which is dropped from a spoon or pastry bag onto the baking sheet.

b. Sliced cookies. These cookies are rolled into a cylinder and sliced. They are made from a stiff dough.

c. Bar cookies. Brownies and some other types are considered bar cookies. Bar cookies are usually rolled, placed on sheetpans, and then flattened.

All of the above cookies can be made using mixes available from Federal Supply Catalog, Group 89, Subsistence. Variations of each cookie type can be made from its mix or by utilizing the Armed Forces Recipe Service. Follow all recipes carefully, whether they be manufacturer's recipes or from the Armed Forces Recipe Service, to obtain the best results.

EXERCISE: Answer the following questions and check your responses with those listed at the end of this study unit.

1. List the three basic types of cookies.

   a. _____

   b. _____

   c. _____

2. Drop cookies are made with a _____ dough.

3. What two cookie types are made with a stiff dough?

   a. _____

   b. _____

4. Brownies are _____ type cookies.

   a. drop
   b. sliced
   c. soft
   d. bar

Work Unit 5-2. MAKEUP OF COOKIES

DESCRIBE THE DOUGH MAKEUP OF DROP COOKIES.

DESCRIBE THE DOUGH MAKEUP OF SLICED COOKIES.

DESCRIBE THE DOUGH MAKEUP OF BAR COOKIES.

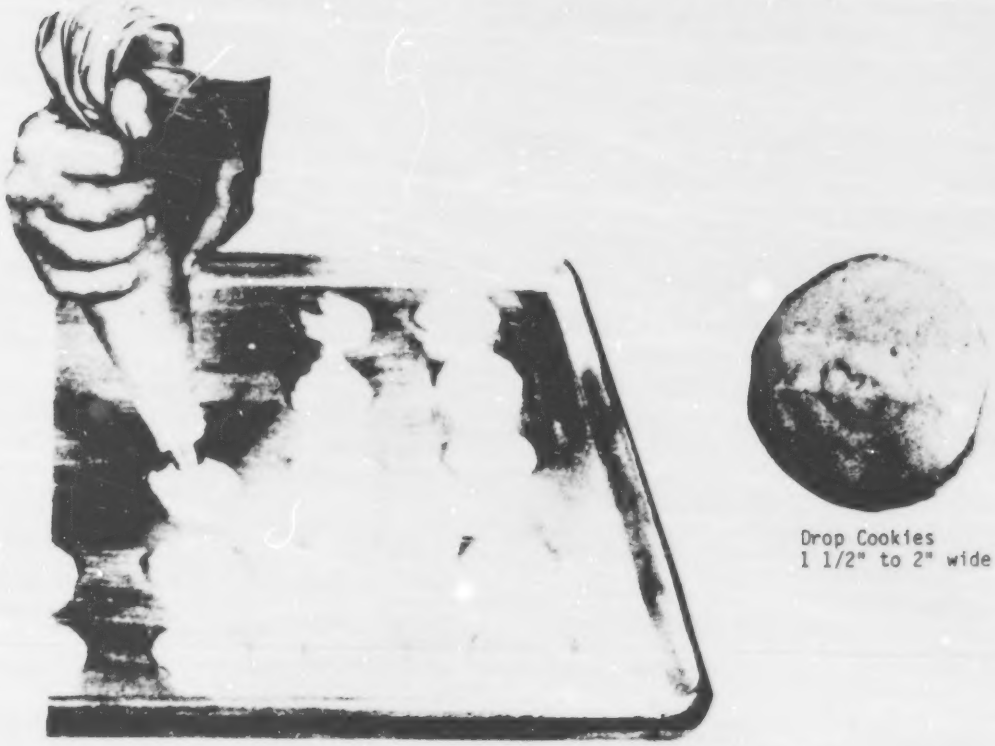
In cookie preparation you may chose between two methods of mixing: the one-stage method and the creaming method.

The one-stage method is the most preferred of the two methods of mixing due to its simplicity. Because this method is simple, the possibility of production errors is reduced. When using this method, sift all dry ingredients together twice; then put all ingredients (both wet and dry) in a mixing bowl and mix at a low speed until they form a smooth dough.

If you use the creaming method, cream together most of the sugar, salt, shortening, and flavorings. Then add the eggs in three stages and mix the ingredients until they are smooth after each addition. After this is done, stir the liquids into the mixture. Next, sift together the flour, baking powder, and remaining ingredients and add them to the mix. Using this mixing method, the more the sugar and shortening are creamed, the more thoroughly the sugar crystals will be broken up and the less the product will spread when baking. Be sure to mix the ingredients the proper amount of time. Mixing the flour for too long a period of time will develop the flour protein, and the cookies will have insufficient spread. If you hold back a portion of sugar and add it with the flour, the cookies will have a better spread.

When nuts, raisins, chocolate chips, or other such items are added with any mixing method, they should be mixed only enough to incorporate them in the batter. Now let's discuss the make up of each type of cookie.

Drop cookies. This cookie type is made from a soft dough. Once the dough has been mixed, the sheet pans to be used must be prepared. Follow recipe instructions regarding whether or not to grease the pans. Drop cookies should all be the same size when dropped. They are dropped from a tablespoon, a scoop, or a pastry bag. Once they are dropped on the sheet pan, ensure that they are spaced evenly apart. Follow the recipe panning instructions. Figure 5-1 shows a method of panning drop cookies with a pastry bag.

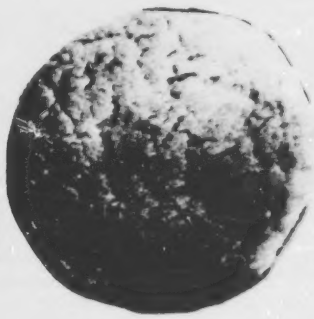


Drop Cookies
1 1/2" to 2" wide

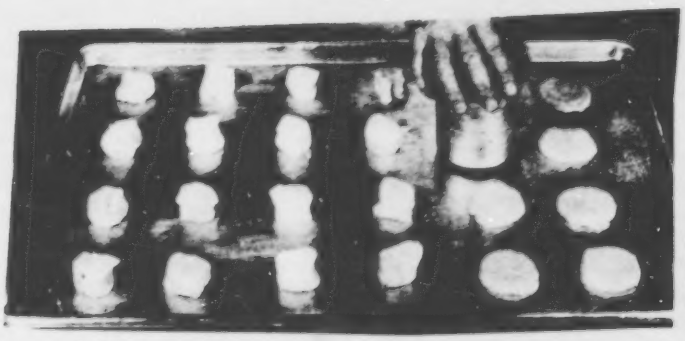
Figure 5-1. Making drop cookies with a bag.

Sliced cookies. These cookies are made from a stiff dough that generally is formed in a cylinder shape. It is then sliced into cookies with a sharp knife and baked on sheetpans. To avoid toughening the cookies, be sure you do not overmix the dough or incorporate extra flour during mixing. Sliced cookies can be rolled out and cut into squares, circles, or other fancy shapes. The method of forming the dough into a roll and then slicing it eliminates the problem of leftover dough. Also when dough is in a cylinder shape, it can be sliced uniformly for the even baking of cookies. Icebox cookies are one example of sliced cookies that are made up in a roll, wrapped in paper, and refrigerated before they are sliced. Figure 5-2 shows how to make sliced cookies.

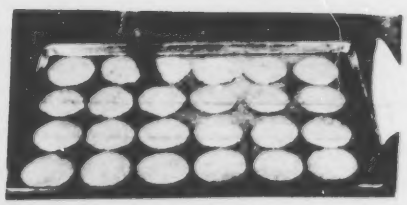
SLICED COOKIES



Sugar Cookies (sliced) 3 1/4" to 3 1/2" wide



Rolling, slicing, and panning sugar cookies



Removed sliced sugar cookies

Slicing refrigerator cookies

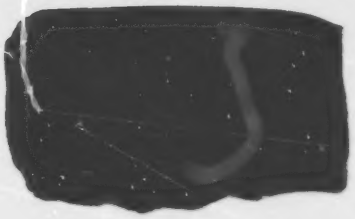
Figure 5-2. Making sliced cookies.

Bar cookie. Bar type cookies are also made from a stiff dough. They are formed from rolls of dough flattened into a strip about 2 or 3 inches wide and the length of the pan. Remove excess dusting flour before baking. Brownies and gingerbread also are considered bar type cookies. The batter is heavy and must be smoothed into the sheet pans. There are two types of brownies, the heavier, chewy, fudge type or the cake type. The mixing method determines the type. Brownies may be frosted if desired. Gingerbread can be topped with a variety of sauces or whipped topping. Figure 5-3 shows the preparation of bar cookies.

BAR COOKIES

Flattening Bar Cookies

Bake bar cookies before cutting



Bar cookies 1 1/2" to 3" wide

Figure 5-3. Bar cookies.

Remember, to prevent dry cookies and loss of flavor, avoid overbaking the cookies. Grease sheet pans according to instructions in the recipes and cut all cookies in uniform size for baking purposes. If the cookies to be made require less than a whole pan for baking, space the cookies evenly in the center of the pan. Be sure to loosen cookies from the pan after baking; otherwise they will continue to bake. Any question on cookies can be answered by referring to the Armed Forces Recipe Service General Information Regarding Cookies Card.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Describe the makeup of drop cookies.

_____

_____

2. Describe the makeup of sliced cookies.

_____

_____

3. Describe the makeup of bar cookies.

_____

_____

_____

Work Unit 5-3. FINISHING BAR COOKIES

DESCRIBE THE METHOD OF FINISHING BAR COOKIES.

After the bar cookies are properly mixed, rolled, and panned, they must then be baked. Once the cookies are baked you are ready to finish them for serving. Immediately after they come from the oven, cut the strips into approximately 12-inch long pieces; this will make it easy to remove the bar cookies from the sheet pans. Then place the strips on a cutting board and cut them into the proper size as directed in the recipe. Do NOT cut cookies while they are in the pan because this will scar the pans. Brownies are turned out like layer cakes. Once they have been baked and pulled from the oven, score them lightly and let them cool. After they have cooled, they can be cut as directed.

Any type of cookie can be finished with icing. Although icing is not necessary, it does give eye appeal to the finished product. If you do ice cookies, do so only after they have cooled to prevent icing from melting or running off. You may use a dusting of powdered sugar if desired in place of icing. Either way will enhance the flavor of the finished product. To prevent the finished product from sticking together, Do NOT cut and stack any cookies, while they are still warm. Remember to follow all recipe instructions in order to produce the best possible finished product.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Describe the finishing of bar cookies.

_____

_____

_____

2. Into what length should bar cookies be cut when finishing them?

_____

_____

3. Bar cookies may be finished with _____ for eye appeal.

4. If cookies are stacked when warm, they tend to _____

Work Unit 5-4. COOKIE FAULTS

LIST COOKIE FAULT KEYWORDS AND MATCH SPECIFIC FAULTS TO THEIR POSSIBLE CAUSES.

When preparing cookies or other pastry items, there is always a chance that something may go wrong in the process. A few common cookie faults are lack of flavor, darkening of cookie, too much spread, and salty taste. When listing cookie faults, the three key words that aid in determining these faults are:

Color. To ensure proper color, remember to grease the pans according to the recipe, be sure the oven is not too hot, and do not overbake. Also be sure the oven temperature is not too low and do not underbake the cookies.

Spread. To ensure the proper spread of cookies, be sure to use the proper amount of leavening. Do NOT flatten cookies too much.

Eating quality. The key to making cookies with good eating quality is to select the best recipe and to follow it carefully using the correct ingredients of the best quality handled with care. Baking is a science and the recipe is your key to success.

Listed below in figure 5-4 is a chart of cookie faults and their possible causes. This can be used as a tool to help you find out what went wrong when you have problems.

COLOR	POSSIBLE CAUSES
Too dark	Pan overgreased Overbaked Oven too hot Too much leavening Baking soda used for baking powder
Too light	Underbaked Oven temperature too low Not enough leavening Baking powder used for baking soda

SPREAD	POSSIBLE CAUSES
Too much spread	Too much leavening Baking soda used for baking powder Flattened too much Wrong sugar Coarse sugar
Not enough spread	Not enough leavening Baking powder used for baking soda Wrong sugar Sugar too fine Pan undergreased

EATING QUALITY	POSSIBLE CAUSES
Too sweet	Too much sugar Not enough flour
Too salty	Too much salt
Soapy taste	Too much baking soda Baking soda used for baking powder
Brittle	Baking soda used for baking powder Too much leavening Too much sugar Too much shortening Overbaked Flattened too much

Fig 5-4. Cookie faults.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the three keywords that aid in determining cookie faults.

   a. _____

   b. _____

   c. _____

2. Match each cookie fault to its possible cause.

_____Too dark	a. too much baking soda
_____Too much spread	b. under baked
_____Not enough spread	c. not enough flour
_____Too sweet	d. coarse sugar
_____Too light	e. fine sugar
_____Soapy taste	f. oven too hot

3. Too much spread in a cookie could be the result of using baking soda in place of _____

4. Eating quality of cookies is affected by using _____ ingredients.

SUMMARY REVIEW

Having completed this study unit, you can now identify the three basic cookie types, are able to describe the makeup of each type, and describe the finishing of bar cookies. Also you are able to describe the cookie faults that are to be avoided.

Answers to Study Unit #5 Exercises

Work Unit 5-1.

1. a. Drop
   b. Sliced
   c. Bar
2. soft
3. a. Sliced
   b. Bar
4. bar

Work Unit 5-2.

1. Made from a soft dough and then dropped from a spoon, a bag, or a scoop.
2. Made from a stiff dough, rolled and then sliced. May be refrigerated depending on recipe.
3. Bar cookies are made from a stiff dough, rolled, and flattened into a strip and panned prior to baking.

Work Unit 5-3.

1. Cut bar cookies baked in strips into 12" long pieces; then place on cutting board, cut as directed in recipe, and ice for eye appeal if desired.,
2. 12 inches
3. icing
4. stick

Work Unit 5-4.

1. a. Color
   b. Spread
   c. Eating quality
2. f.
   d.
   e.
   c.
   b.
   a.
3. Baking powder
4. correct

STUDY UNIT 6

QUICK BREADS

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT YOU WILL BE ABLE TO LIST THE MOST COMMON QUICK BREADS MADE IN THE CENTRAL PASTRY SHOPS, THE TWO QUICK BREAD TYPES AND THEIR MIXING PROCEDURES, THE BAKING FAULTS MOST COMMON TO QUICK BREADS, AND THE KEYWORDS THAT AID IN DETERMINING QUICK BREAD FAULTS.

In the central pastry shops there are a wide variety of products known as quick breads. These items are known as quick breads due to the short amount of time needed for their preparation. Quick breads are leavened by the use of chemical leavening agents such as baking powder or baking soda, as opposed to using yeast. The recipe used will determine the type of leavening to be used.

Work Unit 6-1. QUICK BREAD PRODUCTS

LIST THE FOUR MOST COMMON QUICK BREADS PREPARED IN THE CENTRAL PASTRY SHOP.

There are four types of quick breads that are commonly made in the central pastry kitchen. These four types are biscuits, muffins, corn bread, and coffeecake. All four of these may be made by using ready-prepared mixes that are listed in the Federal Supply Catalog Group 89, Subsistence, or by using the Armed Forces Recipe Service to assemble the basic ingredients. To ensure the best results follow all recipe instructions accurately. Listed below are the most commonly made quick breads with a brief description of each.

Biscuits. Biscuits are made from a dough. Good biscuits are symmetrical in shape with straight sides. They have a slightly rounded top and are golden brown in color. Inside they are creamy white with a flaky texture. Biscuits may be thick or thin, crusty or soft according to preference. Biscuits should be served hot from the oven. They are not necessarily used only for the main meal but can also be served in a dessert such as strawberry shortcake.

Muffins. Muffins are made from batter. Muffins that have been prepared properly are symmetrical in shape, with straight sides and a slightly rounded top. The top should never peak or crack. The color of muffins should be a rich golden brown with a rough pebbly texture and should be slightly glazed in appearance. Muffins frequently are made with fruit mixed into the batter to produce favorites such as blueberry muffins. Muffin pans should be well greased on the bottom but lightly greased on the sides. Remember, if muffins are not to be baked immediately, they should be refrigerated until needed. Follow panning and baking instructions for the best results.

Corn bread. This quick bread resembles a cake but lacks the richness and sweetness of a cake. Instead, it has a flavor all its own, that of corn. Corn bread contains a large portion of cornmeal and is mixed in the same manner as muffins. It also can be baked in either sheet pans or muffin tins. There are several variations of corn bread that can be made using the Armed Forces Recipe Service.

Coffee cake. These cakes are primarily a breakfast pastry and can be made from a dough or a batter depending on the recipe or mix being used. Using the recipe or mix there are a number of variations that can be prepared such as French, apple, apricot, and cherry coffee cake. These items are prepared and panned on sheet pans, baked, and then may be topped with icing or a glaze.

Whenever quick breads are served, bake them as close to serving time as possible and serve them hot.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the four most common quick breads prepared in the central pastry shop.

a. _____

b. _____

c. _____

d. _____

2. Quick breads are known as quick breads due to the short amount of _____ needed.

3. Quick breads should be served _____.

4. Coffeecakes can be made from a _____ or _____.

Work Unit 6-2. QUICK BREAD TYPES AND MIXING PROCEDURES

NAME THE TWO QUICK BREAD TYPES.

STATE THE MIXING PROCEDURES FOR EACH TYPE.

In the production of all quick breads essentially the same ingredients are used. Depending on the amount of liquid used in a recipe there are two types of quick breads, batters and doughs. Batters and doughs are made from a mixture of flour and a varying proportion of liquid. Other ingredients such as shortening, eggs, and flavoring are added to the mixtures to provide tenderness, texture, and a distinct flavor.

A batter is a mixture of such consistency that it can be either stirred or beaten. It also can be either poured or dropped from a spoon once mixed. Muffins, coffeecake, and corn bread are made from batters. A dough contains more flour than liquid and can be kneaded and rolled. Biscuits are made from a dough. Again, when using the canned mixes for doughs or batter, follow all instructions in or on the can.

In preparing to mix dough for quick bread, first properly scale all ingredients and sift the dry ingredients. Your next step is to start mixing the dough. First, blend the shortening with all the dry ingredients so that the shortening is covered with the flour mixture. Blend until the mixture matches the consistency of cornmeal. This step will contribute to the tenderness of the finished product. Once the shortening and flour have been blended, add the liquid. Pour it over as large an area as possible. After this is done, follow the mixing instructions as dictated on the recipe card.

Most cornmeal and muffin batters are made using liquid shortening. When mixing batters, add the liquid, including shortening, to all the dry ingredients. Mix the batter only long enough to incorporate the dry ingredients and to distribute the liquids evenly. Even if your batter looks lumpy, you have mixed it properly if no dry ingredients are showing. For the make-up, pan preparation, and baking instructions of the doughs or batters, refer to the directions on the mix package or in the recipe.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. Name the two quick bread types.

   a. _____

   b. _____

2. Biscuits are quick breads made from _____

3. A batter may look _____ when properly mixed.

4. State the procedures for mixing quick dough and batter when preparing quick breads.

   a. Quick dough. _____

   _____

   b. Batter. _____

   _____

Work Unit 6-3. QUICK BREAD FAULTS

LIST THE SIX KEYWORDS USED IN DESCRIBING QUICK BREAD FAULTS AND

MATCH THE QUICK BREAD FAULTS TO THEIR POSSIBLE CAUSES.

If during the mixing, baking, or preparation of quick breads something is left out or the directions are not followed, the product will have what is referred to as a fault. Faults in all baking can be avoided by following the recipe properly. Read over the card or can instructions and ensure that all steps are accomplished exactly as required. Examples to follow would be things such as mixing times, oven temperatures, and panning instructions. Quick bread faults can be described using six keywords which are discussed below.

a. Crust color. Whether the crust color is too dark or too light depends mainly on the oven heat which can be too high or too low. Use an oven thermometer to check that your oven temperature agrees with that specified on the recipe card or can instructions. If the crust is spotted, it could be caused by too much dusting flour or by improperly mixed dough.

b. Volume. When talking about volume, we are concerned with too great a size of the final product or too small a size. Possible causes could be the use of the wrong amount of batter in each pan before baking, dough that was rolled too thick or too thin, or not enough leavening in the original mix.

c. Symmetry. This has to do with the shape and size of the pastry product. Patrons come to expect that certain products will have a conventional shape. Faults involving symmetry can be caused by too much or too little batter for each pan or too hot an oven.

d. Grain. The grain of a product is determined by the size of the holes throughout it. They can be course or closed or have big holes or tunnels. A few of the causes could be a batter that is overmixed, too hot an oven, or not enough leavening.

e. Texture. Texture in a pastry product is the appearance or feel of the broken surface. It can be crumbly, too dry, tough, or too tender. Some possible causes of this fault would be too much sugar, an overbaked product, batter that was overmixed, or use of too low an oven temperature.

f. Eating qualities. The taste and flavor as well as many other subjective characteristics make up eating qualities. Some possible causes of poor eating quality are old shortening, too much baking powder, or too little sugar or salt.

Figure 6-1 below shows the quick bread faults and possible causes. Use it to check your product when trouble develops. It may give you a clue to improving your product.

CRUST COLOR	POSSIBLE CAUSES
Too dark	Oven too hot Overbaked Too many eggs Too much sugar Too much milk Wrong leavening
Too light	Oven temperature too low Underbaked Wrong leavening Not enough sugar Not enough milk Too much dusting flour Too little batter in pan Dough or batter overmixed Dough too stiff
Spotted	Too much dusting flour Improperly mixed Improperly baked Imoroperly washed

VOLUME	POSSIBLE CAUSES
Volume too large	Too much batter Too much leavening or eggs Dough rolled too thick
Volume too small	Not enough batter Dough rolled too thin Dough not folded properly Not enough leavening

SYMMETRY	POSSIBLE CAUSES
Peaked shape	Oven too hot Batter overmixed Too much bottom heat
Sloped sides	Dull cutter
Irregular shape	Too much batter Improper folding or rolling of dough Overmixing Oven too hot

Fig 6-1. Quick bread faults.

GRAIN	POSSIBLE CAUSES
Holes or tunnels	Batter overmixed Oven too hot Too much bottom heat Not enough liquid Not enough shortening
Open and coarse	Dough or batter overmixed Too much leavening Too many eggs Too much sugar Not enough shortening
Close	Oven too hot Not enough leavening

TEXTURE	POSSIBLE CAUSES
Crumbly	Too much leavening Too much sugar Not enough liquid Oven temperature too low Overbaked
Dry	Dough or batter too stiff Overbaked Oven temperature too low Too much leavening Too much flour Not enough liquid Not enough sugar Not enough shortening
Tough	Not enough sugar Not enough shortening Not enough leavening Dough too cold Batter overmixed
Too tender	Too much sugar Too much shortening Oven temperature too low

EATING QUALITIES	POSSIBLE CAUSES
Rancid	Old shortening
Too sweet	Self-evident
Too salty	Self-evident
Greasy	Self-evident
Soapy	Too much baking soda
Eggy	Self-evident
Bland	Not enough sugar Not enough salt

Fig 6-1. Quick bread faults -- (continued).

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the six keywords used in determining quick bread faults.

   a. _____ d. _____

   b. _____ e. _____

   c. _____ f. _____

2. Match each quick bread fault to its possible cause.

____	Too dark	a.	too much batter
____	Volume too large	b.	dull cutter
____	Peaked shape	c.	not enough leavening
____	Sloped side	d.	overbaked
____	Close grain	e.	oven temperature too low
____	Crumbly texture	f.	old shortening
____	Rancid taste	g.	batter overmixed

SUMMARY REVIEW

Having completed the above study unit, you can now list the four quick breads most commonly made in the central pastry shop. You can name the two quick bread types and the mixing procedure for each. You also can list the three common faults in quick bread and the six keywords that will aid in determining those faults.

Answers to Study Unit #6 Exercises

Work Unit 6-1

1. a. Biscuits
   b. Muffins
   c. Corn bread
   d. Coffee cake
2. preparation time
3. hot
4. dough, batter

Work Unit 6-2

1. a. Dough
   b. Batter
2. dough
3. lumpy
4. (a) To mix doughs the shortening is blended with all dry ingredients. Then the liquid is added.
   (b) When mixing batters, add liquids to dry ingredients (including liquid shortening). Mix only long enough to incorporate dry ingredients and distribute liquid. Don"t worry about lumps.

Work Unit 6-3

1. a. Crust color
   b. Volume
   c. Symmetry
   d. Grain
   e. Texture
   f. Eating quality
2. d.
   a.
   g.
   b.
   c.
   e.
   f.

STUDY UNIT 7

YEAST PRODUCTS

STUDY UNIT OBJECTIVE: UPON SUCCESSFUL COMPLETION OF THIS STUDY UNIT, YOU WILL BE ABLE TO IDENTIFY THE SIX STEPS IN PRODUCING YEAST PRODUCTS, DESCRIBE THE METHOD FOR PREPARING DANISH PASTRY, AND THE YEAST PRODUCTS FAULTS TO BE AVOIDED.

In the Armed Forces Recipe Service there are recipe cards for a wide variety of rolls, coffee cakes, buns and folded dough items which are made from yeast doughs. These items can be made from ingredients using these cards or they can be made from prepared mixes which also produce the desired results when instructions are followed properly. These yeast products are no harder to make than any other type of pastry, but the timing and scheduling must be exact. Due to fermentation periods involved, these items do take longer to prepare and once they are ready, the ovens must be available without delay.

Work Unit 7-1. YEAST DOUGH

LIST THE SIX STEPS IN PRODUCING A YEAST DOUGH PRODUCT.

As in all pastry preparation in the central pastry shop, all items made have certain procedures that must be followed to ensure the desired results. In addition to the six primary steps in producing yeast dough, there is an additional preliminary step which is always required. Yeast must be mixed with warm (but not hot) water to form a suspension and give the yeast a chance to begin growing. The water used should be between 105° and 110°F. The yeast should be left to grow for five minutes. Most yeast available in the Armed Forces is of the active dry type. It is easily mixed with water to form the suspension. Occasionally you may get the compressed type yeast. This should be kept cold in a refrigerator until used. It should be crumbled into water and stirred up. It also requires a five-minute rest before use. If you add yeast on top of sugar, salt, or other concentrated ingredients, it may cause the action of the yeast to slow down and result in a product that has insufficient leavening (air). After you suspend the yeast in warm water and let it rest, there are six steps to follow in the preparation of yeast dough products.

Mixing. After scaling and preparing the ingredients, mix them by machine with a dough hook until all the flour is incorporated into the liquid. After this is done, continue to mix until the dough is smooth and elastic. You must mix thoroughly to distribute the yeast cells and the food for the yeast (sugar), to remove lumps, and to form and develop the gluten. Gluten is developed when the water and the protein in the flour are combined thus causing the dough to have strength and elasticity to retain leavening gases. To determine if the gluten is developed enough, you can stretch the dough so thin you can see through it. Stop at this stage of mixing or the dough will become sticky and won't have elasticity. When mixing dough for sweet rolls, the dough should be fairly soft and slightly sticky.

Fermentation. Once the mixing stage of producing yeast dough is accomplished, place the dough in a lightly greased bowl and smooth the dough by folding. Remember that the dough is going to expand during the fermentation process, so use a bowl that is three times as big as the amount of dough made. The fermentation period is the time between the mixing of the dough and the dividing of the dough. The ideal temperature of the dough at the beginning of fermentation is 80°F (26°C). Fermentation of dough for sweet rolls usually takes from 1 1/2 to 2 hours. The three factors that affect the fermentation time are the quality and quantity of ingredients used, the dough temperature, and the humidity of the fermentation area. During the fermentation time, the dough must be punched. To determine the proper time for this, insert your fingers in the dough about one-third of the way to the bottom and then withdraw them (fig 7-1). If the dough sinks slowly around this depression, it is ready for punching. If it springs back, it is not ready. If the dough sinks rapidly, the time for punching has passed, and it must be punched and the dough made up at once. Punch the dough by pressing it down by hand and folding it from side to side.

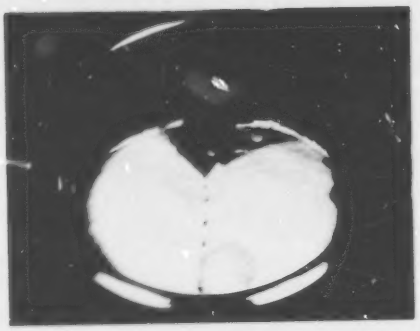
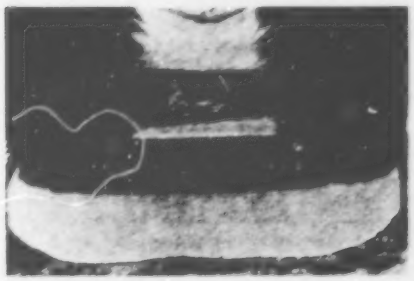


Fig 7-1. Testing the dough for punch.

Makeup. The makeup of yeast dough begins after the dough has been divided and has rested approximately 15 to 30 minutes; however, when making sweet dough, the rest period is approximately 15 minutes. Resting the dough is nothing more than letting the dough relax and have more fermentation time. This also allows the dough to be easier to handle and roll out. Sweet doughs can be made into a variety of sizes and shapes. Some examples of what can be made out of sweet dough are cinnamon rolls, butterfly rolls, twists, coffee cakes and many other folded dough items. For other ideas about sweet dough products refer to the Armed Forces Recipe Service. The makeup of cinnamon and butterfly rolls is shown in figure 7-2.

PREPARING CINNAMON ROLLS



1. Roll dough into rectangle starting at center

2. Sprinkle with raisins, cinnamon and sugar.

3. Roll dough into cylinder.

4. Cut into pieces about 1 1/2 inches thick.

PREPARING BUTTERFLY ROLLS

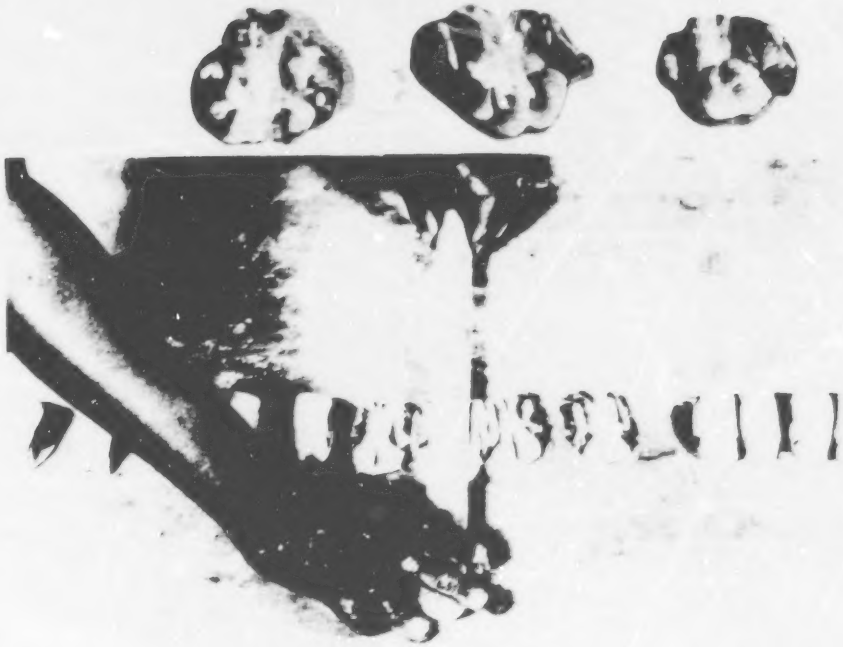


Fig 7-2. Preparation of cinnamon and butterfly rolls.

Proofing. Having shaped the yeast dough as desired, your next step of preparation is proofing. This is the resting of the dough after makeup but just before the final baking. It allows the dough to expand one final time to give tne product its light texture characteristic of yeast products. Pan the rolls according to the instructions on the recipe. Proof plain or sweet rolls until they have doubled in size. Proofing rolls can be done in a proofing cabinet or room. If these methods aren't available to you, cover the panned items with a damp cloth to prevent crusting, but do not let the cloth touch the product, and place it in the warmest area to proof. A tilting fry pan may be used as an improvised proofing cabinet, using the manufac- turer's instructions. The usual proofing time is 35 to 45 minutes. Proofing can be affected by improperly scaled ingredients (too much sugar or too little yeast) or poor quality ingredients (old yeast). Proofing time is increased by cold dough or water, or a cold room temperature. Proofing time may be too fast if ingredients are scaled improperly (too much yeast) and the dough is too warm after mixing. All precautions should be taken not to overproof as this will affect the quality of the yeast product. See figure 7-3 for proofed rolls.

a. Panned rolls

b. Proofed rolls

Fig 7-3. Proofing rolls.

Baking. Prior to the baking of yeast dough, as with any pastry item, the oven must be turned on and heated to the desired temperature. Following all the above listed steps will not help one bit if you have the wrong oven temperature, so check your recipe card and set the oven. Ensure that you have the time to preheat the oven. Some ovens have built-in temperature gauges, but the safe way is to use a thermometer designed for use in the oven. Remember that over-baking or under-baking any pastry product destroys the flavor, appetite appeal and appearance, and causes unnecessary waste. To ensure proper results follow the instructions contained in the recipe for baking the pastry item.

Finishing. The finishing of the prepared pastry item depends on the recipe used and your personal preference. Certain products must be finished a specific way, but never rule out anything from your imagination that could give your product the eye appeal needed to get the most desirable results. Finishing yeast dough or sweet rolls may be done with icing, glazes, powdered or brown sugar, or other toppings. Before applying icings or other topping, check recipe cards to make sure when and how they should be applied.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the six steps used for producing a yeast dough product.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

   f. _____

2. The yeast should be suspended in water between _____^{o} - _____^{o}F.

3. Give the proper method to check dough for punching.

   _____

   _____

   _____

Work Unit 7-2. DANISH PASTRY

LIST THE FOUR STEPS IN PREPARING DANISH PASTRY.

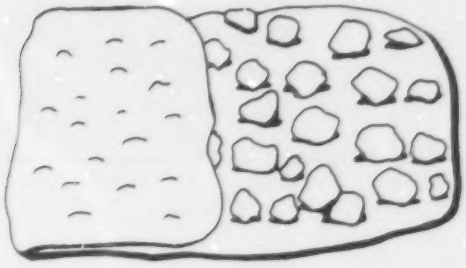
Danish pastry is a semi-flaky yeast item that is produced from a sweet dough by incorporating quantities of fat between the layers of the dough. In this method of preparing the dough, there are four different operations to perform. These are described below.

Mixing. When mixing Danish pastry, mix for the time and at the speed given in the recipe. Scale or measure all ingredients accurately and ensure nothing is forgotten. Be sure the yeast has been suspended in water of the proper temperature to allow the proper fermentation to begin. Mix all ingredients by machine using a dough hook until all flour is incorporated into the liquid. Mix until the dough has the proper elasticity and is smooth in texture. When mixing, it is important that no lumps remain in the mix and that the yeast is evenly distributed in the product. Once the gluten has developed in the yeast dough, it is time to start rolling out the dough for the next step.

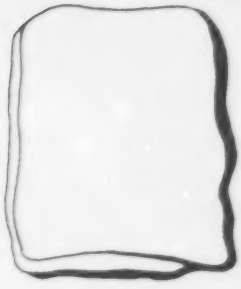
Incorporate butter. Having rolled out the dough, your next step is to incorporate butter into the dough. This is done by covering 2/3 of the dough rectangle with pieces of butter (fig 7-3). The amount of butter to be used will vary from 2-4 oz. of butter per pound of dough and may vary according to the desired richness of the finished product. The butter should be blended into a dough that is flexible and can be worked. A good rule to follow for a proper blend is that the dough and butter used should be about the same consistency. Having them the same will keep the butter from forcing itself up and through the dough when it is rolled after the dough has been folded and sheeted.

Roll and fold the dough. Once the butter has been placed on the dough, lap the uncovered third of the dough over the center of the prepared portion and continue by lapping the re- maining 1/3 over this. By doing this, you now have two layers of butter and three layers of dough (fig 7 -3). Once this is done, the rolling and folding process must be accomplished again. This can be done either three or four more times thus adding to the flake of the finished product by increasing the number of layered dough, each separated by butter. Doing this three times is referred to as the three-fold method. The four-fold method is called the book- fold method.

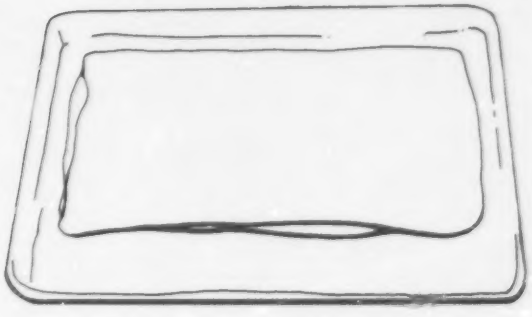
Refrigerate the dough. Refrigerating the dough is done between each time that the dough is rolled and folded. After rolling and folding the dough the first time, place it on a lightly floured pan, grease the top, cover, and chill for 1/2 hour (fig 7-3). This is done to let the dough relax. This process is then repeated as many times as required depending on the method being used. Remember, do not add more fat into the product during the rolling and folding process.



1. Cover 2/3 of the dough rectangle with butter. Fold the 1/3 without butter over the center 1/3.



2. Fold the remaining 1/3 over the 2 layers. Press together.



3. Place folded dough on lightly floured pan, grease top, cover, chill 1/2 hour. Repear 3 more times without fat.

Fig 7-3. Preparing Danish dough.

After completing the four steps in the preparation of Danish pastry, it is time to finish the dough by cutting it into the desired shapes and sizes After having done this, follow the recipe to finish these items as they should be. For examples of how these should look, see figure 7-4.

Alligator

Heart-Shaped Coffeecake

Double Snails

Braid

Swedish Tea Ring

Single Snails

Fig 7-4. Baked Danish pastries.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the four steps in the preparation of Danish pastry.

   a. _____

   b. _____

   c. _____

   d. _____

2. When incorporating butter into Danish pastry how many ounces of butter are used per pound of dough.

   _____.

3. After initially rolling and folding the dough, you end up with two layers of _____ and three layers of _____.

4. How long should the dough be refrigerated between each rolling and folding step?

   _____

Work Unit 7-3. YEAST DOUGH FAULTS

LIST YEAST DOUGH FAULT KEYWORDS AND MATCH SPECIFIC FAULTS TO THEIR POSSIBLE CAUSES.

As in the preparation of all pastries, there are some undesirable results that may occur for any number of reasons in the preparation of yeast dough products. These faults are listed under eight keywords that are used to aid in describing yeast dough faults. Examples of faults in yeast dough products range from using too much dusting flour or too much or too little salt or sugar to overproofing and using the incorrect oven temperature. Listed below are the eight keywords. Following these words is a chart in figure 7-5 that lists the faults that fall under these keywords.

VOLUME	COLOR
CRUST	TEXTURE
APPEARANCE	SHAPE
GRAIN	TASTE

VOLUME	POSSIBLE CAUSES
Too large	Oven temperature too low Dough overfermented Dough overproofed Dough too warm (over 82°F) Pans too small Not enough salt Too much yeast

Fig 7-6. Yeast dough faults.

VOLUME	POSSIBLE CAUSES
Too small	Oven temperature too high Dough undermixed Stiff dough Dough overfermented Too short proofing Pans too large Not enough yeast Low fermentation temperature Pans too cold Too much salt Alkaline water

CRUST	POSSIBLE CAUSES
Blistered	Proofing humidity too high Dough too slack (too much liquid used) Pans jarred after proofing
Too tough (rubbery)	Too much salt Too much milk Too much steam in proofing Oven temperature too low
Brittle	Not enough shortening Too little steam in proofing Not enough salt Not enough sugar Overbaked Underfermented Overfermented Overproofed Oven temperature too high
Too thick	Overproofed Dough exposed to changing temperatures Improper oven temperature Overbaked Too much milk Too much sugar
Too dark	Too much sugar Dough underfermented Oven temperature too high Too much salt Too much milk Flash heat in oven Overproofed
Too pale	Dough overfermented Fermentation temperature too high Oven temperature too low Not enough salt Not enough milk Not enough sugar
Spotted	Proofing humidity too high Improper mixing Too much dusting flour

Fig 7-6. Yeast dough faults -- (continued).

APPEARANCE	POSSIBLE CAUSES
Not uniform	Oven temperature uneven Improper pan greasing Improper pan spacing Improperly blued bread pans
GRAIN	**POSSIBLE CAUSES**
Too close	Underproofed Stiff dough Overmixed Too much salt Not enough yeast
Too open	Improper molding Overproofed Improper sized pans Oven temperature too low
Holes	Too much oil in the divider Too much sugar Too much grease in the dough trough Slack dough
Thick cell walls	Underfermented Underproofed Too much sugar Too much milk Too much salt Too much flour
COLOR	**POSSIBLE CAUSES**
Gray	Dough temperature too high Fermented too long Overproofed Not enough salt Too much milk
Streaked	Dough improperly mixed Too much grease in divider Too much dusting flour on molder Crusted before baking Overproofed Dirty equipment
TEXTURE	**POSSIBLE CAUSES**
Rough	Overproofed Overbaked Not enough water Not enough shortening Overfermented Dough temperature too hot Too much dusting flour
Lumpy	Dirty makeup equipment Undermixed Dough crusted in fermentation or proofing
Crumbly	Overfermented Not enough water Not enough shortening Too much dusting flour Overproofed Overbaked

Fig 7-6. Yeast dough faults -- (continued).

TEXTURE	POSSIBLE CAUSES
Doughy (gummy)	Too much salt Too much milk Underproofed Stiff dough Oven temperature too low
SHAPE	**POSSIBLE CAUSES**
Low ends	Underfermented Underproofed Improper molding Stiff dough Too much milk
Overhanging sides	Overproofed Overfermented Not enough salt Oven temperature too cold
High ends	Improper molding Extremely overproofed Rough handling
TASTE	**POSSIBLE CAUSES**
Salty	Self-evident
Sweet	Self-evident
Sour	Overfermented Dough temperature too hot
Acid	Overfermented Dough temperature too hot Too much salt Too much vinegar
Rancid	Rancid shortening Dirty equipment Extremely overfermented dough
Flat or bland	Not enough sugar Not enough salt
Dry	Overproofed Not enough water Too much flour in mix Too much dusting flour
Milky	Too much milk
Yeasty	Too much yeast
Burnt	Oven temperature too hot

Fig 7-6. Yeast dough faults -- (continued).

The chart above will enable you to determine the possible faults in yeast dough products. Remember, when making any pastry product, read and understand the recipe used.

EXERCISE: Answer the following questions and check your responses against those listed at the end of this study unit.

1. List the eight key words used in determining faults in yeast dough products.

a. _____ e. _____

b. _____ f. _____

c. _____ g. _____

d. _____ h. _____

2. Match the following faults of yeast dough with the possible cause for each.

____Volume too large	a. Not enough yeast
____Appearance not uniform	b. Too much salt
____Spotted crust	c. Undermixed
____Grain too close.	d. Dough temperature too high
____Gray color	e. Oven temperature too high
____Lumpy texture	f. Too much yeast
____Overhanging sides	g. Too much dusting flour
____Salty taste	h. Improper pan spacing

SUMMARY REVIEW

Having completed this study unit, you now can identify the six steps used in producing yeast doughs and can also describe the method used when preparing Danish pastry. You also know the eight key words used in describing faults in yeast dough and some faults common to yeast doughs.

Answers to Study Unit #7 Exercises

Work Unit 7-1.

1. a. Mixing
   b. Fermentation
   c. Makeup
   d. Proofing
   e. Baking
   f. Finishing
2. 105° - 110°
3. To determine the proper time for punching dough, insert fingers 1/3 of the way into the dough, then draw them out. If dough sinks down slowly, it is ready.

Work Unit 7-2.

1. a. Mix
   b. Incorporate fat or butter
   c. Roll and fold
   d. Refrigerate dough
2. 2 to 4 ounces
3. butter, dough
4. 30 minutes or 1/2 hour

Work Unit 7-3.

1. a. Volume
   b. Crust
   c. Appearance
   d. Grain
   e. Color
   f. Texture
   g. Shape
   h. Taste
2. f.
   h.
   g.
   a.
   b.
   c.
   e.
   d.

PASTRY BAKING

Review Lesson

Instructions: This review lesson is designed to aid you in preparing for your final exam. You should try to complete this lesson without the aid of reference materials, but if you do not know an answer, look it up and remember what it is. The enclosed answer sheet must be filled out according to the instructions on its reverse side and mailed to MCI using the envelope provided. The questions you miss will be listed with references on a feedback sheet (MCI-R69) which will be mailed to your commanding officer with your final exam. You should study the reference material for the questions you missed before taking final exam.

A. Multiple Choice: Select the ONE answer that BEST completes the statement or answers the question. After the corresponding number on the answer sheet, blacken the appropriate circle.

Value: 1 point each

1. The nine rules of cleanliness in a dining facility stress keeping yourself, your uniform, and your area clean in order to

   a. aid sanitation.
   b. present a good appearance.
   c. pass inspections.
   d. get your health card.

2. If daily inspections reveal coughs, colds, or other ailments, food service personnel should be referred to

   a. dining facility manager.
   b. chief cook.
   c. medical facilities.
   d. chief food service attendants.

3. What must be done to food service equipment after it has been cleaned to prevent rust or corrosion?

   a. It must be dried.
   b. It must be polished.
   c. It must be sterilized.
   d. It must be rinsed.

4. Insects and rodents can be controlled by the use of insecticides and

   a. detergents.
   b. fumigants.
   c. oven cleaners.
   d. sterilizing solution.

5. How often should incoming supplies be checked for insect infestation?

   a. Biweekly
   b. Weekly
   c. Daily
   d. Monthly

6. Mold growth can be controlled by keeping the area

   a. hot and dry.
   b. cool and dry.
   c. hot and damp.
   d. cool and damp.

7. The primary means of preventing salmonella food poisoning in thawed eggs is to keep them

   a. sterilized.
   b. dry.
   c. refrigerated.
   d. clean.

8. What type of items should you avoid wearing in the dining facility for safety reasons?

   a. Belts
   b. Aprons
   c. Hot pads
   d. Jewelry

9. When should unsafe conditions in a facility be reported?

   a. Immediately
   b. After an accident
   c. After the meal is served
   d. As soon as possible

10. What should you ensure is dry before operating the starting switch on a mixing machine?

a. The machine itself
b. The floor area around the machine
c. The bowl-raising lever
d. Your hands

11. For the safe operation of a steam kettle you should first check the _____ valve.

a. steam
b. water
c. safety
d. air

12. What are the two types of flour used in bakery products?

a. Bread and general purpose
b. Self-rising and normal
c. Enriched and nonenriched
d. Cake and cookie

13. What are the two types of water used in pastry products?

a. Hard and soft
b. Mineral and salt
c. Temporarily hard and soft
d. Permanently soft and hard

14. What effect does hard water have on pastry preparation?

a. Has no effect
b. Speeds fermentation
c. Emulsifies ingredients
d. Slows fermentation

15. What effect does soft water have on pastry preparation?

a. Slows fermentation
b. Speeds fermentation
c. Emulsifies ingredients
d. Has no effect

16. What kind of water may be used in an emergency when authorized?

a. Sea water
b. Soft water
c. Installation water
d. Mineral water

17. What is the most common sweetening agent used in pastry baking?

a. Brown sugar
b. Honey
c. Molasses
d. Granulated sugar

18. What is the type of leavening process that incorporates air into the dough?

a. Chemical
b. Yeast
c. Biological
d. Physical

19. The enzymes in yeast convert sugar to carbon dioxide in what leavening process?

a. Air
b. Physical
c. Chemical
d. Biological

20. Shortening used in the bakery products increases their

a. weight.
b. volume.
c. taste.
d. color.

21. What is the most important function of milk in the pastry product?

a. Aids in the leavening process
b. Provides good crust color
c. Adds to the nutritional value
d. Toughens the finished product

22. The main contribution of eggs to pastry products is to control

a. heaviness.
b. size.
c. shape.
d. moisture.

23. What causes the distinctive yellow color in a yellow cake?

a. Moisture
b. Oven heat
c. Egg yolks
d. Spices

24. What quality does salt contribute in pastry items?

a. Nutrition
b. Color
c. Volume
d. Flavor

25. Flavorings made from alcoholic solutions of a flavoring agent fall into which class of flavorings?

a. Liquid flavorings
b. Dried spices and seeds
c. Cocoa and chocolate
d. Miscellaneous flavorings

26. The commonly used spices in pastry baking are cloves, mace, and

a. oregano.
b. cinnamon.
c. basil.
d. cherry.

27. What kind of an agent is the yeast that is used in pastry products?

a. Microscopic plant
b. Chemical solution
c. Ground herb type plants
d. Animal product

28. In addition to counteracting alkaline water, what kind of water does yeast food help condition?

a. Soft
b. Installation
c. Hard
d. Sea

29. What effect do emulsifiers have when used in pastry products?

a. Improve flavor
b. Cause a hardened crust
c. Shorten keeping qualities
d. Keep product soft longer

30. When used in pastry baking, what is the use of sodium propionate, calcium propionate, and calcium diacetate?

a. Flavoring agent
b. Emulsifier
c. Mold inhibitor
d. Dough binder

31. In addition to pregelatinized starch, which ingredient is used to thicken the fillings for baked products?

a. Cornstarch
b. Sodium propionate
c. Powdered milk
d. Powdered eggs

32. What is the main use of cream of tartar in baked products?

a. To be a dough binder
b. To inhibit mold growth
c. To reduce acidity of the mix
d. To act as a leavening agent with baking soda

33. When measuring ingredients, why is it better to weigh them than to measure their volume?

a. Measuring takes more time.
b. Measuring requires more cleanup time.
c. Weighing is more accurate.
d. Weighing is faster and easier.

34. When sugar is lumpy, what should you do to it before it is measured?

a. Stir it.
b. Sift it.
c. Roll it.
d. Chop it.

35. What are the two types of pie crust?

a. Liquid and solid
b. One crust and two crust
c. Fruit and filling
d. Light crust and dark crust

36. After mixing the dry pie dough ingredients, what is the next step?

a. Mix and roll out
b. Roll out and cut up
c. Add liquid and mix
d. Sift and mix

37. What are the two methods of rolling pie dough?

a. Cold and warm dough methods
b. Short and long methods
c. Hand and machine methods
d. Batter and dough methods

38. One of the two principles of rolling pie dough is to roll from the _____ to the edges.

a. center
b. bottom
c. sides
d. top

39. What is done to ensure steam escape in a two-crust pie?

a. The crust is washed with egg/water.
b. The edges are trimmed.
c. The edges are sealed to the bottom.
d. The top is docked before cooking.

40. What quality is affected by the use of a pie wash?

a. Texture
b. Color
c. Flavor
d. Nutrition

41. Chiffon pies are made with whipped topping and

a. fruit.
b. custard.
c. gelatin.
d. cream.

42. What are the two types of meringue?

a. Heavy and light
b. Cream and foam
c. Cooked and uncooked
d. Sweet and sour

43. Too high an oven temperature could cause a pie crust to be

a. pale.
b. light.
c. soggy.
d. dark.

44. A fruit pie filing that is too thin could be caused by not having enough

a. cream.
b. fruit.
c. starch.
d. water.

45. Which ingredient functions as the chief structure builder in most cakes?

a. Flour
b. Milk
c. Shortening
d. Eggs

46. What is dobie used for?

a. To make cookies
b. To coat cake pans
c. To fill pies
d. To ice cakes

47. In addition to improving eye appeal and taste of cake, icing has what other value?

a. Fills gaps
b. Repairs broken cakes
c. Improves keeping qualities
d. Speeds cake drying and cooling

48. Using too much of what coarse ingredient in cake preparation can cause the grain of the product to be coarse or open?

a. Shortening
b. Salt
c. Water
d. Leavening

49. What ingredient can cause a tough eating quality in cakes when used in too small quantity?

a. Eggs
b. Shortening
c. Milk
d. Yeast

50. In cookie preparation what type of cookies are made from a stiff dough which is flattened into strips?

a. Bar
b. Drop
c. Sliced
d. Stiff

51. Drop cookies can be dropped from an ice cream scoop, a pastry bag, or a

a. fork.
b. dipper.
c. pitcher.
d. spoon.

52. What kind of dough is required for sliced cookies?

a. Soft
b. Heavy
c. Stiff
d. Light

53. How are bar cookies made into strips before baking?

a. Rolled
b. Flattened
c. Stretched
d. Cut out

54. How are bar cookies finished?

a. Cooled in the pan
b. Removed from the pan and cut up
c. Cut in the pan while hot
d. Cut and stacked after baking

55. What could be the cause of a cookie color that is too light?

a. Coarse sugar
b. Underbaking
c. Wrong sugar
d. Overbaking

56. The four most common quick breads are biscuits, corn bread, coffee cake and

a. sweet rolls.
b. doughnuts.
c. brownies.
d. muffins.

57. The two types of quick breads are

a. cooked and uncooked.
b. moist and dry.
c. dough and batter.
d. enriched and normal.

58. What ingredient is mixed with the dry ingredients when making doughs for quick breads?

a. Milk
b. Water
c. Shortening
d. Eggs

59. Inaccurate measurement of ingredients for quick breads can cause poor taste and flavor. Which fault keyword would this fall under?

a. Texture
b. Volume and symmetry
c. Grain
d. Eating quality

60. When quick breads have too small a volume fault, what is one possible cause?

a. Too much batter
b. Too much leavening
c. Dough rolled to thick
d. Not enough leavening

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61. When quick breads have an irregular shape, one possible cause would be that

a. the dough did not shrink properly.
b. the batter was undermixed.
c. a dull cutter was used.
d. too much batter was used.

62. The time between the mixing of a yeast dough and the dividing of the dough is the _____ period.

a. mixing
b. fermentation
c. proofing
d. makeup

63. When sweet rolls are left to double in size, what is the term used to indicate this process?

a. Resting
b. Proofing
c. Expanding
d. Fermentation

64. What ingredient is incorporated between the layers of dough when making Danish pastry?

a. Sugar
b. Spices
c. Butter
d. Eggs

65. When making yeast doughs, a tough rubbery crust may be caused by too much

a. milk.
b. eggs.
c. yeast.
d. flour.

66. A gray color in yeast dough can be caused by too high a (an) _____ temperature.

a. oven
b. water
c. dough
d. room

Total Points: 66

* * *

T&E-1

STUDENT COURSE CONTENT ASSISTANCE REQUEST

DATE:

COURSE NUMBER COURSE TITLE

NAME RANK MOS

SOCIAL SECURITY NUMBER

1. Use this form for any questions you may have about the course. Write out your question and refer to the study unit, work unit, or study question with which you are having problems. Complete the self-addressed block on the reverse side. Before mailing, fold the form and staple it so that MCI's address is showing. Additional sheets may be attached to this side of the form.

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SSN		REPORTING UNIT CODE (RUC)
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3. ☐ REENROLLMENT - Student has course materials (See para. 4003 of Vol. I of MCI Catalog for information on reenrollment.)

4. ☐ OVERDUE FINAL EXAM - Last (Review) lesson sent on _____. Please send exam.

5. ☐ Please send new ANSWER SHEETS.

6. ☐ Please send missing course materials (Not included in course package.)
Lessons____ Manual_____ Other_____

7. ☐ CHANGE - Rank_____ Name _____
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8. ☐ OTHER (explain) _____

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